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Hygiene and Public Health

2209. **Electron Microscopy of Asbestos Bodies and the Fibres of Asbestos.** [Étude au microscope électronique des corps asbestosiques et des fibres d'amiante)
J. CHAMPEIX and J. BOUTEVILLE. *Archives des Maladies Professionnelles* [*Arch. Mal. prof.*] **11**, 607–612, 1950. 7 figs., 3 refs.

Asbestos bodies recovered from sputum have a central fibre of asbestos coated with a colloidal gel, which is probably protein. Removal of the enveloping gel by micromanipulation reveals some transparency of the edges of the asbestos fibre, believed to result from solution. Fibres shorter than 10 μ are not found in the bodies and it is suggested that smaller fibres dissolve completely. On this evidence the authors suggest that pulmonary fibrosis may result from solution of asbestos rather than from some physical irritation.

H. E. Harding

2210. **The Size and Nature of Dust Particles Found in Lung Tissue**
T. BEDFORD and C. G. WARNER. *British Journal of Industrial Medicine* [*Brit. J. industr. Med.*] **7**, 187–194, Oct., 1950. 2 figs., 6 refs.

The authors report a more detailed examination of two previously recorded sections from the lung of a man who had been a shot-firer in an anthracite mine in South Wales. One section was untreated; the other, a duplicate, had been incinerated and treated with acid. Dust particles were measured in strips across 3 areas of nodulation and 3 areas of "reticulation" in the untreated section, and across one of each of these areas in the incinerated section: all particles larger than 0·4 μ in diameter were classified as "coal" or as "minerals other than coal". The percentage size distributions of both types of particles are given in tables: only 0·3 to 0·4% of the particles were larger than 5 μ, the largest seen being 8 μ; the larger particles were mainly coal, the smallest particles mainly silica. Areas of "reticulation" contained a higher percentage of coal particles than did the nodules.

The size distribution of coal and non-coal particles in the section was then compared with that in air-borne dust after shot-firing in the mine where the man had worked. When allowance is made for the effects of particle size on retention in the alveoli the graphs are very similar, for the size of coal particles found in the lung shows a distribution very close to that calculated after examination of mine dust following shot-firing in coal, and the pattern of non-coal particles in the lung is almost the same as that computed from mine dust after ripping shots. This gives a numerical sense to the statement that "the collier's lung is in a very real sense his occupational log book".

[These results are admittedly drawn from a very small amount of material, but there seems no reason to believe that they are not widely applicable.]

H. E. Harding

2211. **Thresher's Lung (Pulmonary Moniliasis). An Experimental Investigation.** [In English]
L. ZETTERGREN. *Upsala Läkareförenings Förhandlingar* [*Upsala LäkFören. Förh.*] **55**, 257–313, Dec., 1950. 29 figs., bibliography.

The natural history of *Candida albicans* is described. Fermentation and staining properties are discussed. The fungus may be a saprophyte or a pathogenic parasite in human subjects: in the latter role it may metastasize and cause endocarditis or meningitis.

Pulmonary moniliasis is recognized as an occupational disease of tea-tasters (who rub the leaves and inhale their aroma); it may cause an epidemic pneumonia among young children, and since 1932 has been recognized as causing epidemics of broncho-pulmonary disease among threshers of mouldy grain and farmers handling mouldy hay. It is stated that fungi other than monilia may be causal and in some of the cases allergy may be the principal factor. The clinical picture is that of a febrile tracheo-bronchitis, and the outstanding symptom dyspnoea. Radiological changes are not invariably present and vary from a faint accentuation of the normal lung markings to a miliary "snowstorm", with or without dense hilar and perihilar shadowing and, in the chronic cases, large fibrotic opacities. [In view of the common occurrence of *Candida* as a saprophyte, it is unfortunate that better criteria for a firm diagnosis of its pathogenicity in a given case are not available.]

As the condition is rarely fatal, necropsy reports are few and concern chiefly the extra-pulmonary endocarditic or meningitic cases. Experimental intravenous injection of suspensions into animals has resulted in widespread miliary lesions, especially in the kidneys. The macroscopic appearance of the lesions resembles that of tuberculosis, and this similarity is present histologically also; there are foci of epithelioid cells, with giant cells and occasional central necrosis (caseous or purulent); fungus cells are rather sparse in these granulomata and have been observed phagocytosed within giant cells.

An experiment was performed, rabbits being exposed to sterile threshing dust and others to similar dust containing monilia. The method is described. The animals were examined radiologically and at necropsy, and fractionated serum protein determinations were made, being considered more accurate than agglutination tests. Animals exposed to sterile dust (series A) developed emphysema, miliary interstitial " dust granulomata ", and intrapulmonary lymph-node hyperplasia. These animals showed no radiological changes. Animals exposed to dust containing *Candida* and killed a few days after the last exposure (B1 series) showed finely floccular or streaked opacities radiologically. These animals' lungs contained " tuberculoid granulomata ", differing from the dust granuloma in consisting of epithelioid cells, and having a surround of lymphocytes and often a caseous centre; there was also a more definite mucopurulent bronchitis. In animals killed 10 weeks after the last dust-exposure (B2 series), dust granulomata were absent, but tuberculoid granulomata were still seen, though tending to become more diffuse, less definitely " epithelioid ", and containing more lymphocytes: the presence of large aggregations of lipophages was noted. The B1 series yielded *Candida* on culture from the bronchi of 4 of 12 animals examined; series B2 yielded none. The only alteration noted in the serum protein levels was a significant increase of γ-globulin in series B2.

The author considers the dust granuloma to be an interstitial chronic pneumonia: the tuberculoid granuloma probably differs from this in being due to toxins released from disintegrating fungal cells. The lipoid material in the lipophages is probably derived from fungal cells also. He states that *Candida* once within the bronchi does not survive long, and certainly does not proliferate. The disease, therefore, is probably not a true mycosis, but a reaction to the endotoxins contained in the fungal cells. The increase in gamma globulin indicates an antibody formation evoked by antigens in the *Candida* cells. *L. W. Hale*

2212. **Physiological Evaluation and an Attempt at Standardization of Generalized Vibration.** (Физиологическая оценка и опыт нормирования общей вибрации)
E. T. ANDREEVA-GALANINA. Гигиена и Санитария [*Gigiena*] No. 10, 3–10, Oct., 1950. 2 figs.

Experiments were performed to determine the effects of vibration in various industries and arising from sundry machines. The standards employed were determined by methods chosen to eliminate subjective assessments, which are often unreliable. Each type of vibration had to be studied separately. The author invented a platform which could be made to produce long-period vibrations of varying frequency. Vibration is detected by special receptors in the skin, these being most numerous in the hands and feet. The lower limits of perception are around 15 Hz and highest around 8,192 Hz. Adaptation to vibration takes place if it is felt for a short time, but with longer periods this is not the case and the subject becomes sensitized.

The skin galvanic reflex was used as a test. In 1889 Tarkharof found that there was a current in the skin which increased with differing stimuli. In 1892 Barkanof found that there was a regular wave motion in the skin current, controlled by the central nervous system. As a result of vibratory stimuli this wave motion may be altered in a characteristic manner. In young subjects the normal wave motion differs from that in older people and the variations caused by external stimuli are more marked, though the return to normal is also more rapid. This quick return occurs when the stimulus used is three times greater than the threshold figure.

Effects of high-frequency vibrations, but not of those of low frequency, could be fairly easily assessed. Another method was therefore sought, the vestibular reflex being eventually used. Water was injected into the ear at 17° C. and the resulting nystagmus was noted. If a vibratory stimulus was superadded the degree and duration of nystagmus were affected. By low-frequency vibrations the period of nystagmus was shortened. If the subject was rotated on a platform the degree of vertigo was less if concomitant vibration stimuli were used. Low-frequency vibration caused a fall in blood pressure. In the caloric test the return to normal blood pressure was delayed by vibratory stimuli. Vibration shortened the latent period of perception of pain.
G. C. Pether

2213. **Radiation Hazards in the Atomic Energy Program**
M. EISENBUD. *Industrial Medicine and Surgery* [*Industr. Med. Surg.*] **20**, 7–11, Jan., 1951.

2214. **The Application of Immunological Tests of Sera from Captured Wild Animals to the Study of Yellow Fever Epidemiology**
T. P. HUGHES and A. PERLOWAGORA. *American Journal of Tropical Medicine* [*Amer. J. trop. Med.*] **30**, 835–853, Nov., 1950. 2 figs., 14 refs.

The response of certain common vertebrates in Brazil to the bites of mosquitoes infected with yellow fever virus was studied under controlled conditions, with the following results: circulating antibody was not found in *Akodon arviculoides*, *Oryzomys*, and *Didelphis paraguayensis*, nor was neutralizing antibody formed. *Metachirops opossum*, *Proechimys dimidiatus*, *Euphractus sexcinctus*, and *Dasypus novemcinctus* circulated virus after exposure only occasionally or in very low titre. Complement-fixing antibody in *P. dimidiatus* was regularly but transiently formed; its presence is thus an indication of recent infection. In no other species was this test of value. Circulating virus was abundant in *Metachirus nudicaudatus*, and neutralizing antibody was regularly but transiently formed, positive results thus indicating a recent infection. Thus, in interpreting the results of immunological tests in surveys positive results are valid only if the animal is known to produce antibodies regularly in response to infection, while the duration of these antibodies in such an animal is of importance. Non-specific virucidal activity of sera renders results misleading unless the tests are controlled for specificity. *J. L. Markson*

Anatomy and Cytology

2215. **The Morphology of the Attachment between the Dermis and the Epidermis**
G. F. ODLAND. *Anatomical Record* [*Anat. Rec.*] **108**, 399–413, Nov., 1950. 12 figs., 10 refs.

The structure of the junction of the dermis and epidermis was investigated in pieces of human skin from the abdomen and plantar surface of a toe, and in skin removed from the palm, sole, abdomen, and thigh of rhesus monkeys. The tissues were fixed in Zenker's or Rossman's fluid, embedded in paraffin, and sections cut both perpendicularly and parallel to the skin surface. They were stained by Masson's trichrome method, and by Pap's ammoniacal silver nitrate (modification of Mitchell and Wislocki) for the demonstration of reticulum fibres.

It was observed that the cytoplasmic processes of the basal epidermal cells fit into the spaces of a continuous meshwork of dermal reticulum, which possesses no free endings interdigitating with the cell processes. Evidence is adduced that those reticular fibres which seem to terminate in bulbous ends in contact with the basal epithelium are really strands of the dermal reticular network which have been cut in such a way that they appear as blunt processes in histological sections.

R. J. Ludford

2216. **The Origin, Course and Termination of the Prefronto-pontine Tract in the Human Brain**
E. BECK. *Brain* [*Brain*] **73**, 368–391, 1950. 27 figs., 18 refs.

2217. **Brain Cells from Human Fetuses and Infants, Cultured *in vitro* after Death of the Individuals**
M. J. HOGUE. *Anatomical Record* [*Anat. Rec.*] **108**, 457–475, Nov., 1950. 15 figs., 16 refs.

Brain tissues were obtained from foetuses of from 16 mm. length to full-term stillborn infants, and from infants that lived one day and 5 months respectively. The temperature at which the brains were kept before culture was most important. When kept at 6° C., some growth invariably occurred up to the 9th day after death. The longer the refrigeration at 6° C. the longer was the lag period before cells began to migrate from explants into the culture medium. The parts of the brain cultured were the cortex of frontal and occipital lobes, caudate nucleus, hippocampus, walls of the lateral ventricles, cerebellum, and medulla oblongata. Cultures were prepared by the hanging-drop and roller-tube methods. Explants were fixed in position in a clot of fowl plasma, and chick-embryo extract and human placental serum diluted with Tyrode solution was renewed at intervals of a few days. Some cultures survived more than 323 days. In the cultures it was possible to identify a few neurons and many oligodendroglia and macrophages. Purkinje cells and glia, which were detected in explants, were observed to migrate into the medium. In other instances neurons and glia were presumptively identified by their shape, size, and other characteristics. *R. J. Ludford*

2218. **Observations on the Vertebral and Basilar Arteries and their Branches in Man, with Special Reference to the Lateral Parolivary Fossa**
D. A. SUGERMAN. *Medical Journal of Australia* [*Med. J. Aust.*] **2**, 402–406, Sept. 9, 1950. 8 figs., 14 refs.

In 42 specimens the arteries of the pons and medulla were studied with particular reference to the blood supply of the lateral parolivary fossa, the region bounded by the restiform body, the olive, the lower end of the pons, and the cerebellum. This region is supplied by (*a*) direct branches from the vertebral artery or through the posterior inferior cerebellar or lateral medullary vessels; (*b*) usually a direct branch from the lower end of the basilar artery or by the anterior inferior cerebellar or internal auditory artery, or sometimes through posterior inferior cerebellar branches arising from the basilar artery. It was confirmed that when the basilar artery deviates from the mid-line, its convexity tends to be directed towards the side of the smaller vertebral artery (Hasebe's Rule). *R. Barer*

2219. **Arteriovenous Shunts in the Human Lung**
C. E. TOBIN and M. O. ZARIQUIEY. *Proceedings of the Society for Experimental Biology and Medicine* [*Proc. Soc. exp. Biol., N.Y.*] **75**, 827–829, Dec., 1950. 9 refs.

It has been shown that glass spheres many times the accepted diameter of capillaries will pass through the pulmonary vessels of dogs and rabbits. Fresh human lungs from 20 normal adults and 3 newborn infants were therefore perfused through the pulmonary artery with saline to which had been added several hundred glass spheres varying in diameter from 10 to 750 μ. The perfusate was collected from the pulmonary vein, and examination under ultraviolet light, which increases visibility, showed the presence of spheres up to 500 μ in 9 adult and 2 neonatal lungs. When the remaining lungs were injected with liquid latex or vinyl acetate and the blood vessels dissected, spheres of similar diameter were present in the pulmonary veins; spheres larger than this had lodged in the pulmonary artery. Radio-opaque media added to the injection mass in 6 adult lungs demonstrated the site of the largest arterio-venous shunts at the apex of the lobular divisions of the broncho-pulmonary segments, with smaller shunts at the level of the bronchioles (50 to 100 μ) and alveolar sacs (20 to 25 μ). *A. Paton*

2220. **The Problem of the Origin of Accessory Lungs.** (Zur Frage der Enstehung von Nebenlungen)
F. BOLCK. *Virchows Archiv für Pathologische Anatomie und Physiologie* [*Virchows Arch.*] **319**, 20–43, 1950. 7 figs., bibliography.

Physiology and Biochemistry

2221. **The Flight Adaptation Syndrome.** (Le syndrome d'aéroadaptation)
N. BEREST. *Médecine Aéronautique* [*Méd. aéronaut.*] **5**, 219–231, 1950. 2 refs.

An attempt is made to apply Selye's theory of general adaptation to aviation medicine, to give a monistic concept of the "flight adaptation syndrome". Air-sickness is taken to represent the phase of shock, and is said to be followed by a phase of countershock, characterized by diuresis, hypertension, and pyrexia associated with euphoria. Phases of hyper- and hypo-adaptation are described, the former characterized by over-confidence, the latter corresponding to operational fatigue and neurosis. The absence of data on the phase of exhaustion is noted.

[This paper is far-reaching in its implications, but is entirely speculative.] *D. H. Sproull*

2222. **The Role of the Central Nervous System in the Control of Periodic Breathing.** (О значении центральной нервной системы в механизме возникновения периодического дыхания)
Y. M. BRITVAN and A. G. KUDISH. Архив Патологии (*Arkh. Patol.*] **12**, No. 6, 35–41, 1950. 3 figs., 10 refs.

2223. **The Lungs and the Vascular Effect of Adenosine Triphosphate.** (Poumon et action vasculaire de l'adénosine-triphosphate (A.T.P.))
L. BINET and M. BURSTEIN. *Presse Médicale* [*Pr. méd.*] **58**, 1201–1203, Oct. 28, 1950. 9 figs., 9 refs.

This paper, from the University of Paris, starts from the fact that haemolysed blood will produce dilatation of peripheral vessels. This the authors confirmed, using their technique of perfusing the dog's limb with its own (heparinized) blood. Intra-arterial injection of laked erythrocytes produced a striking fall in blood pressure locally, but not in the circulation as a whole as estimated in the carotid artery. Intravenous injection of the same material failed, rather unexpectedly, to produce either a general fall in blood pressure or evidence of peripheral vasodilatation. This suggested that the active principle might be destroyed in the lungs. This supposition was supported by the finding that injection into the right auricle did cause the expected fall in blood pressure. Acetylcholine and histamine both produced hypotension when given intravenously, hence the responsible agent in lysed blood is neither of these. Working on the hypothesis that the active principle is derived from adenylic acid the authors carried out similar experiments with adenosine triphosphate and obtained results similar to those obtained with laked blood—vasodilatation and a fall in blood pressure when given into the right auricle, but little effect when given intravenously. They conclude that the active hypotensive principle in lysed erythrocytes is probably adenosine triphosphate, and that the lungs, by inactivating this substance, play a protective part in states of traumatic or other shock associated with haemolysis. *A. T. Macqueen*

2224. **Studies on Parathyroidal Function in Relation to Hormonal Influences and Dietetic Conditions.** [In English]
B. ENGFELDT. *Acta Endocrinologica* [*Copenhagen*] [*Acta endocrinol., Kbh.*] Suppl. 6, 1–118, 1950. 16 figs., bibliography.

2225 (*a*). **Changes in the Level of Ascorbic Acid in the Plasma in Response to the Introduction of Glucose into the Body.** (Wachania poziomu kwasu askorbinowego w osoczu po obciążeniu ustroju glukozą)
J. W. GROTT. *Polskie Archiwum Medycyny Wewnetrznej* [*Polskie Arch. Med. wewn.*] **20**, 112–113, 1950.

2225 (*b*). **A Study of the Level of Ascorbic Acid in the Blood Cells and Plasma.** (Badania nad zachowaniem zie kwasu askorbinowego w osoczu i krwinkach)
J. W. GROTT and F. KOSTKIEWICZ. *Polskie Archiwum Medycyny Wewnetrznej* [*Polskie Arch. Med. wewn.*] **20**, 113–114, 1950.

These two preliminary reports draw attention to the rise in the level of ascorbic acid in the plasma after an intake of 50 g. of glucose. Ascorbic acid was estimated by Abt–Farmer's method at half-hourly intervals. In 36 cases the plasma level of ascorbic acid rose by 0·2 to 0·79 mg. per 100 ml. The release of ascorbic acid from its visceral depots is attributed to the stimulation of the adrenal cortex by the glucose.

The normal cell/plasma ratio of ascorbic acid was 4 : 1. After the intake of 50 g. of glucose the ascorbic acid level rose markedly in the cells and later in plasma also. With the complete saturation of the cells the level of ascorbic acid in plasma continued to rise until the normal cell/plasma ratio was reversed. *J. T. Leyberg*

2226. **Effects of Cortisone and ACTH Therapy on Eosinophils of the Bone Marrow and Blood**
R. L. ROSENTHAL, N. WALD, A. YAGER, and J. LITWINS. *Proceedings of the Society for Experimental Biology and Medicine* [*Proc. Soc. exp. Biol., N.Y.*] **75**, 740–741, Dec., 1950. 5 refs.

Eosinophil counts were performed on blood and bone marrow of 7 patients before and during either cortisone or ACTH therapy. At a time of marked diminution in the eosinophils of the peripheral blood, the eosinophilic cells of the bone marrow were not decreased.—[Authors' summary.]

2227. **Role of Glutaminase in the Production of Urinary Ammonia**
B. M. A. DAVIES and J. YUDKIN. *Nature* [*Nature, Lond.*] **167**, 117, Jan. 20, 1951. 5 refs.

2228. **Distribution of Blood in the Rabbit's Kidney**
W. INSULL, I. G. TILLOTSON, and J. M. HAYMAN. *American Journal of Physiology* [*Amer. J. Physiol.*] **163**, 676–683, Dec., 1950. 2 figs., 23 refs.

Attempts were made to confirm by perfusion experiments the hypothesis that renal blood flow may be diverted from cortical to medullary regions by a " shunt ". When excised rabbit kidneys were perfused with 2·5% Prussian blue in 6% gum-acacia solution at low pressures (25 cm. H_2O), only the deep juxta-medullary glomeruli were filled. At higher pressures (50 cm. H_2O) all glomeruli were filled. Renal blood flow was directly measured and systemic blood pressure recorded in anaesthetized eviscerated rabbits, and the distribution of glomeruli receiving blood under various conditions (stimulation of renal nerves, stimulation of central end of sciatic nerve, haemorrhage) shown by the intra-arterial injection of Janus green B. The deeper glomeruli were never free from dye when the peripheral ones were stained. In some experiments the juxta-medullary glomeruli were uniformly stained while those in the peripheral areas of the cortex were unstained. This distribution, resembling that originally described by Trueta (*Studies of the Renal Circulation*, Oxford University Press, 1947), only occurred when renal blood flow was low. The results do not support the hypothesis that blood is diverted from cortical to medullary pathways by direct or reflex stimulation of renal vasoconstrictor nerves. *R. A. Gregory*

CIRCULATORY SYSTEM

2229. **The Influence of Baro-receptors in the Lower Limb of the Frog on the Heart.** (Wird die Tätigkeit des Froschherzens über Pressorezeptoren in den hinteren Extremitäten reflektorisch beeinflut ?)
W. RÖSSEL. *Pflügers Archiv für die Gesamte Physiologie* [*Pflüg. Arch. ges. Physiol.*] **253**, 55–58, 1950. 1 ref.

It has been reported (Dawidow, *Fiziol. Ž.*, 1940, **28**, 524), that if the pressure under which a frog's hind limbs are being perfused is raised the heart's action is reflexly affected. This effect is abolished by section of the vagi, sympathetic, and spinal cord.

In the present paper the primary finding is confirmed but the effect on the heart is shown not to be due to a nervous reflex. It is a mechanical effect, due to retrograde filling of the right auricle from the perfused limbs through anastomotic vessels in the vertebral muscles and the vertebral column. *P. Mestitz*

2230. **Conduction Velocity and Excitation Spread in the Atrium of the Dog.** (Die Leitungsgeschwindigkeit und Erregungsausbreitung in den Vorhöfen des Hundes)
W. BRENDEL, W. RAULE, and W. TRAUTWEIN. *Pflügers Archiv für die Gesamte Physiologie* [*Pflüg. Arch. ges. Physiol.*] **253**, 106–113, 1950. 5 figs., 13 refs.

The conduction velocity in the atrial muscle of the dog is 0·8 metre per second; the time to maximum of the action potential is 1·2 milliseconds; the " distance to maximum "—that is, the distance travelled by the action potential in the " time to maximum "—is 0·96 mm. All waves of excitation spread radially outwards from the sinus node. There is no evidence for the existence of any specialized conducting system in the atria of the dog. *P. Mestitz*

2231. **Additional Evidence for the Anti-d: Statistical Studies**
J. M. HILL, S. HABERMAN, R. GUY, and J. W. DAVENPORT. *Blood* [*Blood*] **5**, 1049–1058, Nov., 1950. 5 refs.

The finding of a serum containing agglutinins against the d (Hr_o) antigen has been reported previously by these workers (Haberman *et al.*, *Blood*, 1948, **3**, 682). This paper is directed to refuting Wiener's suggestion that this serum contained only a weak anti-c (hr') which simulated anti-d by failing to react with some bloods positive to c, just as in tests with weak anti-A serum bloods of sub-group A_2B may fail to clump (Wiener, *Blood*, 1950, **5**, 693).

The results of the reactions of 232 blood samples to anti-d, anti-D, and anti-c are analysed by the chi-square test. The significant $\chi^2=0{\cdot}1862$ reveals the allelism between D and d, whereas $\chi^2=18{\cdot}8042$ for the relationship D–c indicates that these are unrelated. Genetical studies of selected families were carried out and in each case the erythrocytes reacted with the anti-d serum as required by the genotypes. Cells of genotype CDe/Cde gave negative reactions with potent anti-c serum and positive results with the anti-d serum, again ruling out Wiener's assumption. *Harold Caplan*

2232. **Studies on the Permeability of Erythrocytes. III. The Effect of Physostigmine and Acetylcholine on the Permeability of Dog, Cat and Rabbit Erythrocytes to Sodium and Potassium**
W. C. HOLLAND and M. E. GREIG. *American Journal of Physiology* [*Amer. J. Physiol.*] **162**, 610–615, Sept., 1950. 4 figs., 12 refs.

It has previously been shown by the same workers that changes in fragility of erythrocytes in the dog can be correlated with changes in the rate of destruction of acetylcholine by the enzyme cholinesterase present in the cell membrane. In the present work the effects of acetylcholine and prostigmine were studied on the permeability of the cell membrane to sodium and potassium ions. Experiments were performed *in vitro* on dog, cat, and rabbit erythrocytes.

Erythrocytes were much more stable in a medium containing acetylcholine than in either a medium with both acetylcholine and prostigmine or control medium with neither substance present. The cells able to metabolize acetylcholine showed a decreased permeability to potassium, a decreased tendency to haemolyse, and a decreased swelling. The change in permeability to sodium only occurred late in the experiments. The presence of prostigmine reversed the acetylcholine effect, the degree of reversal depending on the degree of inhibition of cholinesterase activity.

These results appear to support the hypothesis that the fragility of erythrocytes is affected by the activity of the enzyme cholinesterase present in the cell membrane. If an appreciable amount of the substrate (acetylcholine)

is present and the enzyme activity is high, the fragility is lowered and the cell remains intact for longer periods of time. If the enzyme itself is destroyed or inhibited by prostigmine, the fragility is not reduced even if a considerable amount of acetylcholine is present. The energy produced by the hydrolysis of acetylcholine may be used to prevent entrance of potassium and sodium ions or to eliminate them after they have entered.

R. P. Foggie

2233. **Electrical Impedance Plethysmography. A Physical and Physiological Approach to Peripheral Vascular Study**

J. NYOBER. *Circulation* [*Circulation*] **2**, 811–821, Dec., 1950. 4 figs., 19 refs.

A method is proposed for the study of peripheral vascular changes based on the fact that the A.C. resistance (impedance) of a segment of a limb between two encircling electrodes may be considered as due to the resistance of the blood contained in the segment in parallel with the resistance of other tissues. From impedance determinations the volume of the pulse in millilitres may be derived; and from this, blood-volume changes in the segment can be calculated. Application of the method in the forearm and leg showed that the pulse volume was proportional, but not necessarily equal, to the true arterial inflow or venous outflow from a segment. It was shown that the rate of blood flow in a peripheral segment was approximately equal to the rate of filling of a previously emptied venous reservoir produced by a change in posture of the segment. *R. A. Gregory*

NUTRITION AND DIGESTION

2234. **Nutritional Value of Plant Materials. V. Reproduction of Rats Fed Purified Rations Containing Soybean Protein**

M. O. SCHULTZE. *Journal of Nutrition* [*J. Nutrit.*] **42**, 587–596, Dec., 1950. 11 refs.

The rats employed in these experiments were kept on purified rations containing sucrose, hydrogenated vegetable fat, corn oil, salts, and a soy-bean preparation, supplemented with DL-methionine, having a protein content of 24%. All available vitamins except vitamin B_{12} and ascorbic acid were added to the diet.

The most striking effect of these rations on the post-parturient reproductive performance was the abnormally high mortality rate in the young during the first 4 days after birth. Up to 30 to 40% of the litters died with symptoms of acute uraemia of the newborn. Addition of 2% liver extract or condensed fish extract to the maternal diet greatly increased the survival rate of the young. The possibility of microbiological synthesis of vitamin B_{12} and perhaps of other essential factors was considered, especially as addition of 2% phthalylsulphathiazole to the maternal diet reduced the incidence of acute uraemia of the newborn. Supplementing the ration containing soy-bean protein with liver extract did not influence significantly the length of the oestrous cycle, the number of corpora lutea implantations, resorptions, or the number or weight of the offspring of the first pregnancy. *Z. A. Leitner*

2235. **Sterility in the Rabbit associated with Soybean Hay Feeding**

K. A. KENDALL, G. W. SALISBURY, and N. L. VANDEMARK. *Journal of Nutrition* [*J. Nutrit.*] **42**, 487–500, Dec., 1950. 3 figs., 20 refs.

During previous experiments when it became necessary to change from lespedeza hay to soy-bean hay a reduction in the litter size in New Zealand white rabbits was observed. In ewes fed on soy-bean hay abnormal reproduction has also occasionally occurred. The following experiments were therefore carried out to determine the relation of soy-bean hay feeding to reproductive failure.

Three groups of experiments were performed on New Zealand white rabbits fed on different types of hay and wheat. The feeding of wheat together with lespedeza or alfalfa hay resulted in normal pregnancy, but feeding of wheat and soy-bean hay caused partial reproductive failure, such as failure in implantation, early foetal death, stillbirth, decreased litter size, haemorrhages with normal prothrombin time, and partial foetal resorption. In many instances females on the soy-bean hay diet refused to accept the male, others lost the young owing to failure to provide nests or to suckle them satisfactorily.

The factors responsible for these changes are not evident at present. In spite of apparently adequate supplies of α-tocopherol and carotenoids, the similarity of the observed clinical symptoms to those met with in experimental vitamin-A and -E deficiency in rats cannot be disregarded. If they are the sequelae of inadequate vitamin-A levels, could such a deficiency occur in the rabbits given soy-bean hay on account of carotene destruction due to a coupled oxidative reaction associated with the enzyme lipoxidase? Lipoxidase is able to peroxidize unsaturated fats, and the intermediate products have a bleaching effect upon carotene; carotene thus bleached has been shown to be ineffective as a source of provitamin A.

Further studies are in progress to show whether carotene destruction through the action of lipoxidase could be a contributing factor in causing the above symptoms in New Zealand white rabbits fed on soy-bean hay. *Z. A. Leitner*

2236. **Artificial Enrichment of White Rice as a Solution to Endemic Beriberi. Report of Field Trials in Bataan, Philippines**

J. SALCEDO, M. D. BANBA, E. O. CARRASCO, G. S. CHAN, I. CONCEPCION, F. R. JOSE, J. F. DELEON, S. B. OLIVEROS, C. R. PASCUAL, L. C. SANTIAGO, and R. C. VALENZUELA. *Journal of Nutrition* [*J. Nutrit.*] **42**, 501–523, Dec. 1950. 3 figs., 5 refs.

A previous survey indicated that over 12% of the population of the Bataan peninsula had beriberi. These findings were consistent with the known mortality from beriberi, both in Bataan and in the Philippines as a whole, over a period of many years.

The Bataan experiment with enriched rice reported here has some extraordinary features. It was not a simple physiological trial with enforced consumption, but rather an appraisal of several factors which may influence the choice of diet by people living in their customary environment, buying their food in the open market, and being subject to persuasion, prejudices, and inhibitions. In order to obtain significant results under these conditions it was essential to have a large enough population, constituting an independent economic society reasonably free from extraneous influence; hence the choice of the relatively isolated and economically homogeneous Bataan peninsula. Comparisons were contemplated of the prevalence of beriberi before and after the introduction of the fortified rice, but it was also decided that a control area with about 30,000 inhabitants should be observed at the same time as the experimental area, which has a population of over 63,000. The subdivision proved ultimately successful, although there occurred some infiltration of enriched rice to the control area. Trained inspectors examined the rice weekly in the mills, shops, and markets, and nearly all homes were visited at least once during the first year of enrichment. This inspection gave satisfactory control over the use of rice in the areas concerned and it indicated the extent of infiltration of fortified rice into the control areas. The enrichment consisted of adding 2 mg. aneurin, 16 mg. niacin, and 13 mg. iron to every lb. (0·45 kg.) of rice (the estimated average daily rice consumption per person was 360 g.)

The organization, as well as the clinical statistical methods used, were the same as in the previous survey before the introduction of enriched rice. The total incidence of beriberi after introduction of fortified rice in the experimental area was 1·55%, in the control area 8·7%: there was a considerable infiltration of fortified rice in parts of the control area, otherwise the incidence rate would have been much higher. The severity of beriberi diminished greatly in the experimental area, but increased in the control area. The study of mortality figures is equally impressive; the mortality from beriberi per 100,000 was 263 in the year immediately before enrichment; at the end of the first year of use of fortified rice it was 28. The infant mortality rate from beriberi per 100,000 population fell during the same period from 226 to 107 (a fall of 52·6%) in the enriched-rice area, while it rose from 146 to 153 (5%) in the control area.

[This most stimulating paper should be read in the original as it is impossible to quote the statistical findings in a short abstract.] *Z. A. Leitner*

2237. **The Fluorescence Phenomenon of the Tongue**
W. Tomaszewski. *British Medical Journal* [*Brit. med. J.*] **1**, 117–120, Jan. 20, 1951. 22 refs.

Fluorescence of the tongue under ultraviolet light, which is due to the production of porphyrins by oral bacteria, was studied in various diseases. This pink fluorescence is due to the coalescing of small fluorescent points corresponding to the filiform papillae.

The subjects included over 400 patients attending the blood clinic of the Edinburgh Royal Infirmary and 214 normal persons of all ages as controls. An ordinary ultraviolet lamp and a Wood's glass were used for viewing, and those patients whose tongue showed any fluoresence, however slight, classed as positive. No difference in sex incidence was demonstrated, but the occurrence of fluorescence decreased steadily with age. In the control series 18% showed no fluorescence. Fluorescence was absent in no less than 64% of 87 cases of pernicious anaemia, although haemoglobin levels were normal: 5 out of 6 untreated cases were negative, 2 of these developing fluorescence on treatment. The findings in iron-deficiency anaemia, sprue syndrome, and peptic ulcer were similar, but the numbers were small. Antibiotics, given orally, abolished the phenomenon, which returned within a few days of stopping the antibiotic. Sulphathiazole lozenges had no effect: 3 out of 5 patients who had no fluorescence developed it after the administration of B-group vitamins.

The possible factors involved in the production of fluorescence, and its clinical value (which is doubtful), are discussed without definite conclusions being reached.

Helen Grant

2238. **The Excretion of Amino Acids in Normal and Undernourished Human Subjects following a Single Infusion of an Amino Acid Preparation**
S. Levey, E. D. Hoganson, J. E. Harroun, and C. J. Smyth. *Journal of Nutrition* [*J. Nutrit.*] **42**, 71–80, Sept., 1950. 1 fig., 17 refs.

An investigation was undertaken to determine whether the nutritional state of human subjects could be correlated with the excretion pattern of individual amino-acids following intravenous administration of a known amino-acid mixture as a test dose. The subjects of the study were 4 normal persons and 4 undernourished patients who were known to have depleted protein stores. Nine amino-acids were used. No difference was found in either the excretion of the individual amino-acids or the total excretion pattern which could be attributed to the nutritional state of the subjects.

[Another nail is thus added to the coffin of " saturation " or " load " tests.] *H. M. Sinclair*

2239. **Effect of Pancreatectomy on Phospholipid Synthesis in the Dog**
W. F. Barker, K. E. Rogers, and F. D. Moore. *Archives of Surgery* [*Arch. Surg., Chicago*] **61**, 1151–1162, Dec., 1950. 4 figs., 22 refs.

Although the exact nature of the lipotropic factor of the pancreas has not yet been elucidated, the fatty degeneration of the liver which occurs in depancreatized dogs when they are maintained on insulin but are not given special lipotropic medication (lecithin, choline, or other fractions of the pancreas) is presumably related to a defective metabolism and utilization of fats. In such fatty livers fat accumulates in the form of neutral triglyceride, and a relative (and sometimes absolute) diminution in phospholipids (of which approximately half are choline-containing lecithins) occurs.

In the present study radioactive phosphorus (approximately 0·1 mc. per kg.) was administered by stomach

tube to 10 normal dogs and 11 depancreatized dogs; venous blood samples were drawn from the femoral or jugular vein into heparinized syringes at frequent intervals over a period of 100 hours; the inorganic phosphorus and the phospholipid phosphorus fractions of the plasma were separated, and their respective content of phosphorus was determined by the usual chemical methods; aliquots were measured with a Geiger–Müller counter and the concentrations of radioactivity and phosphorus in the inorganic and phospholipid fractions were expressed as " specific activities " (" units " of radioactivity per mg. of phosphorus); thus the ^{32}P : ^{31}P ratio of each fraction was determined. Biopsies of the liver were taken at the time of pancreatectomy and at subsequent necropsy.

The results showed no significant variation in the radioactivity of the inorganic phosphorus in the plasma of dogs studied during a period of 1 to 5 months after pancreatectomy and in normal dogs. The radioactivity of the phospholipid phosphorus in the plasma, however, was significantly depressed in the former group, regardless of whether fatty degeneration of the liver had or had not developed at the time of observation.

The findings show that in the absence of the pancreas there is a depressed ability to incorporate recently ingested ^{32}P into plasma phospholipid. It is suggested that the metabolic defect in the synthesis of phospholipids occurs through the absence of a " pancreatic factor ", either " a true metabolic hormone or an endogenous substance reabsorbed from the pancreatic secretion or an exogenous food factor absorbed through the agency of the pancreatic secretion ", which may enter into the phosphorylation mechanism of the liver as a " co-factor ". The hypothesis that a similar mechanism may be responsible for the deposition of cholesterol and other fats in the blood vessels of depancreatized dogs or in the blood vessels of human diabetic patients is considered to deserve further study. *Joseph Parness*

2240. **Normal Values for Serum Cholesterol and Basal Metabolic Rates and their Correlation in Normal Man**
A. L. Peeler, O. E. Hepler, V. M. Kinney, L. E. Cisler, and F. T. Jung. *Journal of Applied Physiology* [*J. appl. Physiol.*] **3**, 197–203, Nov. 1, 1950. 1 fig., 18 refs.

The authors report an investigation into the possible relationship between the serum cholesterol content and basal metabolic rate (B.M.R.) which was carried out at North-western University Medical School, Chicago, on 72 healthy male students between 19 and 27 years old. The subjects were given a standardized supper and kept under a standard regimen during the evening before the tests, which were all carried out before breakfast. Two B.M.R. determinations were made with a Benedict–Roth apparatus, the average of two 6-minute runs being taken, followed by a blood serum cholesterol estimation, carried out in duplicate by a modified Bloor's method. The whole procedure was repeated after a 7-day interval with 32 of the subjects, and after an average of 38 days with the remaining 40. The mean B.M.R. for the whole group was 37·0 Calories per square metre per hour (range, 30·9 to 45·3) and the test–retest correlation coefficient for the two successive sessions was +0·60. The mean serum cholesterol value was 189 mg. per 100 ml. (range 131 to 303) and the test–retest correlation coefficient at 7- and 38-day intervals was +0·87, indicating that Bloor's method was reliable and that the serum cholesterol level was a more stable characteristic of normal individuals than the basal metabolic rate. There was no correlation between the cholesterol value and the basal metabolic rate, as is shown by the statistically insignificant correlation coefficient of −0·03. *R. P. Hullin*

2241. **The Lipotropic Effect of Folic Acid on Rats Receiving Various Purified Diets**
B. Kelley, J. R. Totter, and P. L. Day. *Journal of Biological Chemistry* [*J. biol. Chem.*] **187**, 529–535, Dec., 1950. 11 refs.

The effect has been studied of folic acid or vitamin B_{12}, or both, upon the amounts of cholesterol, total fatty acid, and phospholipid in the liver, of rats given various purified diets. With a diet containing 18% casein and 12% fat, folic acid was found to prevent the accumulation of neutral fat in the liver; this lipotropic effect was also observed when 10% glycine, with or without 4% ribose nucleic acid, was added to the diet. With glycine and ribose nucleic acid in the diet, cholesterol was increased in the liver and this increase was prevented by folic acid. *H. M. Sinclair*

2242. **Niacin and the Ability of Cystine to Augment Deposition of Liver Fat**
E. P. Tyner, H. B. Lewis, and H. C. Eckstein. *Journal of Biological Chemistry* [*J. biol. Chem.*] **187**, 651–654, Dec., 1950. 6 refs.

It has previously been shown in Britain and in the authors' laboratory that cystine prevents the accumulation of fat in the liver of rats given a diet low in casein and high in fat. Giving 5% casein and 40% fat in a diet free of choline, the authors find that the accumulation of fat only occurs if the dietary amount of nicotinic acid or tryptophan is low. *H. M. Sinclair*

2243. **Observations on an Unknown Dietary Factor Essential for Human Growth**
S. E. Snyderman, L. E. Holt, R. L. Nemir, L. P. Guy, R. Carretero, and K. C. Ketron. *Journal of Nutrition* [*J. Nutrit.*] **42**, 31–44, Sept., 1950. 11 figs., 19 refs.

A diet of purified casein, partly hydrogenated vegetable fat, " dextrimaltose ", salts, cod-liver oil, and vitamins was given to 11 children aged between 3½ and 40 months. The B vitamins included folic acid but not biotin or vitamin B_{12}. The casein contained streptogenin. Ten of the infants ceased to gain weight or lost weight after variable periods. In 8 of these 10 infants the effect of supplements was tried: butter or biotin was ineffective, brewer's yeast inconstant, and a normal diet satisfactory. No haematological changes were observed. It is suggested that an unknown factor, perhaps vitamin B_{12} or the " animal protein factor ", is required for human growth. *H. M. Sinclair*

Pharmacology and Therapeutics

2244. **The Sensitivity of Frog Muscle to Potassium and Acetylcholine. II. Effect of Quinidine on Thiocyanate–Potassium Sensitization.** [In English]
E. VANREMOORTERE. *Archives Internationales de Pharmacodynamie et de Thérapie* [*Arch. int. Pharmacodyn.*] **84**, 48–56, Nov., 1950. 2 figs., 12 refs.

Thiocyanate sensitizes the frog rectus abdominis muscle to potassium chloride and also to acetylcholine, but the muscle contraction due to quinidine is unaffected by thiocyanate or by changes in potassium concentration. Quinidine reduces the sensitivity of the muscle first to acetylcholine and later to potassium. These findings agree with those of Harvey with veratrine and quinine on other tissues. However, on the frog rectus some loss of potassium sensitivity always accompanies any considerable inhibition of the action of acetylcholine by quinidine. After exposure to a suitable concentration of quinidine, while the muscle is still sensitive to potassium and no shortening has occurred due to the quinidine, the response to potassium is still increased by thiocyanate. Quinidine reduces equally the sensitivity of the muscle to thiocyanate and potassium together and to potassium alone. It appears that the antagonistic action of quinidine is not exerted on the sensitizing mechanism. Quinidine antagonizes the effect of potassium rather than of thiocyanate. These results are discussed in relation to the inhibition by quinine of various myotonias and of the action of veratrine on skeletal muscle.

Derek R. Wood

2245. **The Relationship Between Muscle Length and Membrane Potential. The Mode of Action of Local Analgesics which Abolish Contractures.** (Weitere Untersuchungen über die Abhängigkeit der Muskellänge vom Membran-Potential. Der Wirkungsmechanismus kontrakturverhutender Lokalanästhetica)
A. FLECKENSTEIN, E. WAGNER, and K. H. GÖGGEL. *Pflügers Archiv für die Gesamte Physiologie* [*Pflüg. Arch. ges. Physiol.*] **253**, 38–54, 1950. 3 figs., 32 refs.

The frog's rectus muscle was used in these experiments. All contracture-producing substances are also depolarizing agents. The degree of contracture varies with the degree of muscle depolarization. All substances which abolish contractures (procaine, cocaine, and other local analgesics, antihistamine drugs, calcium ions, atropine, and curare) act by preventing depolarization of the muscle fibres. Such agents may in high concentrations themselves cause depolarization and contracture of the fibres.

P. Mestitz

2246. **A Study of the Qualitative Differences in Response to Analgetic Drugs.** [In English]
D. D. BONNYCASTLE and J. IPSEN. *Acta Pharmacologica et Toxicologica* [*Acta pharmacol., Kbh.*] **6**, 333–353, 1950. 5 figs., 5 refs.

Adult male rats were used in estimating the analgesic activity of morphine, methadone, pethidine, codeine, aspirin, and amidopyrine. A constant heat stimulus was applied to the rat's tail, and the reaction time in seconds recorded from the beginning of the stimulation to the time when the animal made a significant defensive reaction. An examination was made of a dose range in regular logarithmic intervals from the smallest dose producing an effect up to the minimum lethal dose. All drugs were given intraperitoneally and a complex system of random selection was used to reduce individual variation. The analgesic reaction curve was constructed by plotting the mean response at 70 minutes after the drug (increase in reaction time over the control value) against the log. dose.

For aspirin and amidopyrine the curves were S-shaped and symmetrical, and by the use of a suitable general expression a true comparison of potency was obtained. Amidopyrine was 2·26 times as potent as aspirin (amidopyrine 110 mg. per kg. body weight and aspirin 250 mg. per kg. body weight). For the morphine group of drugs, however, all were found to give a two-stage dose response curve, consisting of a primary slope and a secondary slope connected by an intermediate, almost horizontal, curve of varying length. Comparison could thus be made at two dosage levels; at the higher, pethidine and codeine were about equal in potency, possessing about 30% of the activity of morphine, while in low doses codeine was about half, and pethidine one-tenth, as active as morphine. Methadone had about the same potency as morphine.

[The experimental results are of interest, but clearly show that advances in this type of assay work will be slow. The estimates of potency based upon the median narcotic doses appear to place the various drugs in an order resembling that obtained clinically. The validity of a reference standard, however, is negligible since the potencies vary almost independently of each other. The sensitivity of a strain of rats to pethidine, for example, cannot be predicted by measuring its sensitivity to morphine.]

G. B. West

2247. **An Examination of the Synergism in the Actions of Codeine and Acetylsalicylic Acid.** [In English]
D. D. BONNYCASTLE, J. IPSEN, and J. MOLLAND. *Acta Pharmacologica et Toxicologica* [*Acta pharmacol., Kbh.*] **6**, 354–363, 1950. 4 figs., 6 refs.

The analgesic action of codeine, aspirin, and mixtures of the two drugs was studied, a modification of the d'Armour Smith method in rats being used. Radiant heat of constant intensity was applied to the rat's tail until a significant defensive reaction occurred. To avoid tissue injury, a limit was placed on the duration of the stimulus. The doses used were 2, 4, 8, 16, 32, 64 mg. codeine per kg. body weight, and 100, 200, 300 mg. aspirin per kg.; they were administered intraperitoneally to male albino rats. The curves relating the mean analgesic effect to the log. dose of the two drugs are

basically different. The effect of aspirin levels off at about 25% pain loss, whereas codeine has a steep rise in effectiveness at high doses, so that no single factor expresses the potency relationship of the two drugs. If the codeine response is plotted on an arithmetical dose scale (in place of log. dose), most doses lie on a linear regression. The differences in position of this curve of codeine alone and that of codeine with aspirin at various time intervals clearly indicate that simple summation of doses occurs over a 3-hour period.

No potentiation of the codeine activity by the addition of aspirin was found in this study, and doubt is cast on the clinical impression that the codeine action is potentiated in mixtures of codeine with aspirin or other analgesics of the aspirin type. *G. B. West*

2248. **Methadone and Respiratory Tract Fluid**
E. M. Boyd and M. Buell. *Canadian Medical Association Journal* [*Canad. med. Ass. J.*] **63**, 588-590, Dec., 1950. 5 refs.

" Amidone " (" methadone " or " physeptone "), a synthetic analgesic, is particularly useful in the treatment of severe cough. It is generally considered to have a depressant action on the cough centre similar to that of morphine, but since it is active against dry cough it was thought possible that it might act peripherally by increasing the output of fluid secretion in the respiratory tract. To determine whether this is so experiments were performed on cats, rabbits, guinea-pigs, and albino rats. Each animal was lightly anaesthetized with urethane, supplemented with local analgesia when required, and the output of respiratory-tract fluid was noted at successive intervals of ½ to 1 hour, the rate of secretion during each period being calculated in ml. per kg. body weight per 24 hours. The technique of collection has previously been described (Perry and Boyd, *J. Pharmacol.*, 1941, **73**, 65; Boyd *et al.*, *Amer. J. Physiol.*, 1943, **138**, 565). The rate varied to some extent from animal to animal and from hour to hour, but mean values for several animals of the same species were fairly constant after the first hour of collection, being 2 to 4 ml. per kg. per 24 hours for cats and rabbits, and 5 to 10 ml. for guinea-pigs and albino rats. Amidone was then administered to a number of animals 3 hours after the arrangements for collection of fluid had been completed, this post-operative interval being found sufficient for a stable, normal rate of output to be established, and the output was determined during the next 4 hours. The drug was injected subcutaneously in some cases and given by stomach tube in others. The smallest dose used was 0·1 mg. per kg., which corresponds to the therapeutic dose in man, other doses employed being 0·5, 1·0, 5·0, and 10 mg. per kg.

No significant or constant effect upon the rate of secretion in the respiratory tract after the subcutaneous injection of amidone was noted in 13 cats, 12 rabbits, 11 guinea-pigs, and 10 albino rats, and similar negative results were obtained when the drug was given by stomach tube to 10 cats, 7 rabbits, 10 guinea-pigs, and 10 albino rats. The authors therefore conclude that the action of methadone in allaying severe cough is central.
R. Hodgkinson

2249. **Studies on Aerosols. X. A Study of Therapeutic Aerosols in Connection with Some Critical Characteristics of Small Aerosol Generators and their Relation to the Administration of Aleudrine.** [In English]
L. Dautrebande. *Archives Internationales de Pharmacodynamie et de Thérapie* [*Arch. int. Pharmacodyn.*] **84**, 1–47, Nov., 1950. 30 figs., bibliography.

Desirable features of aerosols and of generators of therapeutic aerosols are summarized and discussed. The following attributes have been combined in twelve tested pieces of apparatus, none of which is more than 12 cm. in length: (1) The aerosol should be of uniform, small micellary size (less than 1 μ). This ensures penetration into the deepest parts of the lung. Retention may be increased by using a hygroscopic vehicle, highly concentrated aggregate-forming solutions, or cooling before inhalation. (2) Only a small amount of material should be deposited per unit time (without greatly reducing the size of the jet), thus preventing excessive systemic absorption. (3) The operating pressure should be low yet consistent with stability of colloids in the aerosols. (4) The generator should be of small size.

These generators produce aerosols of mean micellary size of 0·2 μ (measured by a sedimentation method) or 0·1 μ (by electrostatic precipitation). In 5 generators there is a single jet for both air and liquid, and aerosols of constant quality are produced at pressures between 5 and 70 lb. per sq. inch (0·35 kg. and 4·92 kg. per sq. cm.). They can be operated with a hand bulb or by continuous pressure, with 1 to 2 ml. of liquid, do not require cleaning, and do not deliver any wetting particles. According to the diameter of the jet the amount of solution delivered is from 2·5 to 8 g. per hour with a pressure of 10 lb. per sq. inch.

After 10 deep breaths, the breath being held at the peak of inspiration, a rapid bronchodilator effect without side-effects can be obtained from a 1% solution of " isoprenaline " with generators giving 3 to 6·5 g. per hour. Increasing the pressure or the number of jets allows the amount of solution delivered to be increased 3- or 4-fold. Large and rapid changes in dosage are thus possible and the generators are suitable for giving large doses of penicillin, for example.

[Those interested in the constructional details of these generators are referred to the original paper.]
Derek R. Wood

2250. **Effects of Diphenylhydantoin Sodium (Dilantin Sodium) and Phenobarbital Sodium upon Ectopic Ventricular Tachycardia in Acute Myocardial Infarction**
A. S. Harris and R. H. Kokernot. *American Journal of Physiology* [*Amer. J. Physiol.*] **163**, 505–516, Dec., 1950. 4 figs., 33 refs.

The view that the mechanism of production of ectopic ventricular impulses in acute myocardial infarction might be similar to that involved in the production of focal epileptic seizures led to the trial of anti-epileptic drugs in experimental ventricular ectopic activity. Phenytoin (up to 200 mg. per kg. body weight) was found to abolish ectopic ventricular tachycardia due to myocardial necrosis occurring in dogs after ligation

of one coronary artery by a two-stage method (Harris, *Circulation*, 1950, **1**, 1318). The quantity of drug required varied with the ectopic frequency: its effect was enhanced by phenobarbitone, and the latter was effective alone in suppressing ectopic rhythms. Some toxic effects of intravenous injection of phenytoin were observed. *R. A. Gregory*

2251. **Arterial Volume Pulses and Peripheral Vascular Responses to Drugs**
R. A. McLean. *Proceedings of the Society for Experimental Biology and Medicine* [*Proc. Soc. exp. Biol., N.Y.*] **75**, 585–590, Nov., 1950. 3 figs., 14 refs.

The peripheral blood flow was studied in a number of subjects [number and species not stated, though it can be inferred that two experiments were performed on cats and one on a dog]. An impedance plethysmograph was used for studies of the blood flow on live animals or men. [In this method a low-voltage high-frequency current is made to pass through the body and an impedance bridge records the resistance to that current. Changes in this resistance are claimed to represent changes in blood flow in the region through which the current has passed. The method can be used almost anywhere and it does not alter what is intended to be measured.] Arterial pulsations were also recorded [presumably in animals] by placing a small mirror on top of the isolated arteries. Light was thrown first on to the mirror and then through a photomultiplier on to a recording apparatus. It is claimed that changes in the diameter, and also in the capacity, of the artery were recorded in a way which was similar to the making of tracings from a sensitive plethysmograph.

The chief value of these methods seems to be that they allow a study of the effects of various drugs on the peripheral circulation after a drug has been injected into an artery and before it has reached the heart. Thus it is claimed that direct stimulation of the heart by adrenaline may overcome some of the vasoconstrictor effects of that substance. Some evidence is also given in support of the view that tracings of the pulse volume of an artery can give a fair idea of changes in the blood flow through the regions supplied by that artery.
E. M. Glaser

2252. **The Renal Excretion of Digitoxin in the Normal Subject after Single and Continuous Administration of the Drug**
M. Friedman, R. Bine, S. O. Byers, and C. Bland. *Circulation* [*Circulation*] **2**, 749–755, Nov., 1950. 2 figs., 6 refs.

Young adults excreted 3 to 5% of an oral dose of 1·2 mg. of crystalline digitoxin within 24 hours, and 40% was excreted within the month. Elderly subjects excreted rather less. Much of this glycoside was excreted in an active form. Chemical extraction of the digitoxin from the total daily urine was made by a previously described method. The strength of the extracts obtained was estimated from their effect on the heart of the embryonic duck (*Proc. Soc. exp. Biol., N.Y.*, 1947, **64**, 162).
H. E. Holling

2253. **Effects of the Magnesium Ion on the Heart and on its Response to Digoxin**
J. B. Stanbury and A. Farah. *Journal of Pharmacology and Experimental Therapeutics* [*J. Pharmacol.*] **100**, 445–453, Dec., 1950. 6 figs., 12 refs.

It had been previously shown that the magnesium ion slows the cat heart by: (1) blocking sympathetic ganglionic transmission at the stellate ganglion; and (2) depressing the sino-atrial node independently of nervous influences. Atrial flutter was induced in the decentralized dog heart by making a crush in the right atrial wall and momentarily applying to the atrial surface electrodes delivering "1 millisec. square wave shocks of about 10 volts at a frequency of 8 to 12 per second". The atrial flutter was usually followed at half the rate by the ventricles. The intravenous injection of gradually increasing doses of magnesium chloride in 1·05 M solution into these animals caused proportionately greater slowing of the atrial rate, until a dose of 600 mg. restored the normal rhythm. Since the circumference of the circus was fixed, the slowing caused by the magnesium must have been due to an effect on conduction velocity, and since the circus movement finally stopped, the refractory period was probably increased.

In the heart–lung preparation, increasing the serum concentration of magnesium lowered the systemic output but increased the stroke volume, and the total output remained very nearly constant. The heart rate decreased, while the left and right atrial pressures and the coronary flow increased. The addition of calcium chloride to the system reversed these changes with the exception of the coronary blood flow. Increasing the level of the magnesium ion in the blood had little effect on the toxic or lethal doses of digoxin, but when magnesium chloride is added quickly to a preparation showing toxic effects caused by digoxin it may produce a temporary restoration of normal rhythm. *P. A. Nasmyth*

2254. **Digitalis Delirium**
J. T. King. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1360–1372, Dec., 1950. 6 figs., 16 refs.

The author describes 6 cases in which the administration of digitalis in various forms was followed by mental disturbance. As a rule the patients tolerated 1 mg. of digitoxin, but became delirious after 2 mg. Reasons are given for attributing the delirium directly to the toxic action of the drug rather than to circulatory changes or the absorption of toxic oedema fluid. *V. J. Woolley*

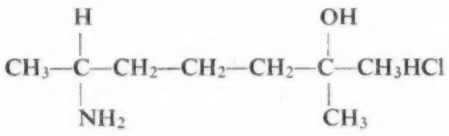
2255. **Theophylline Blood Levels after Oral, Rectal and Intravenous Administration, and Correlation with Diuretic Action**
E. B. Truitt, V. A. McKusick, and J. C. Krantz. *Journal of Pharmacology and Experimental Therapeutics* [*J. Pharmacol.*] **100**, 309–315, Nov., 1950. 3 figs., 8 refs.

Blood theophylline levels were studied following the administration of aminophylline by various routes. A colorimetric method previously described was employed (*J. Pharmacol.*, 1947, **91**, 185). Rectal retention enemas caused a very rapid rise in the blood level, and one hour later the concentration in the blood was very nearly

the same as after intravenous injection, but the very high levels caused by intravenous injection were avoided. Absorption from rectal suppositories was very slow, a result which confirmed the findings of Waxler and Schack (*J. Amer. med. Ass.*, 1950, **143**, 736). A concentration greater than 0·5 mg. theophylline per 100 ml. blood was produced by a dose of 0·5 g. aminophylline, given either intravenously or by rectal retention enema, from the first to the fourth hours after administration. A similar concentration was produced by the same dose 3 to 6 hours after oral administration. Comparable doses of aminophylline gave lower blood theophylline levels in dogs than in man. *John R. Vane*

2256. **The Cardiotonic, Coronary Vasodilator, Diuretic, and Pulmonary Hypotensive Properties of 6-Amino-2-methyl-2-heptanol Hydrochloride (" 2831 RP ").** (Les propriétés cardiotoniques coronaro-dilatatrices diurétiques et hypotensives droites du chlorhydrate d'amino-6-méthyl 2-heptanol 2 (corps 2831 RP))
G. GIRAUD, A. LOUBATIÈRES, and H. LATOUR. *Presse Médicale* [*Pr. méd.*] **58**, 1165–1166, Oct. 21, 1950. 13 refs.

The compound " 2831 RP " is structurally



It is described as a powerful cardiotonic possessing properties like digitalis, but causing no tachyphylactic or nephrotoxic reactions. It is said to possess coronary dilator and diuretic properties and to cause a lowering of the pulmonary arterial pressure. On the isolated papillary muscle of the right ventricle of the cat and dog it had an effect, at the very small concentration of 1 in 20 million, comparable with that of ouabain, but its action was a little more rapid and less prolonged. In this preparation it was less toxic than ouabain, the toxic concentration being 1 in 20,000 compared with 1 in 5 million for ouabain.

In man (some 20 subjects were studied) the intravenous administration of 100 mg. increased the contractile force of the heart, with an increase of the general arterial pressure by 20 to 25 mm. of mercury. This effect occurred within 5 minutes; it was maintained for 30 minutes and then diminished within 1½ hours. There was no effect on diastolic pressure. It is said to have produced very good results in 4 cases of cardiac failure.

The coronary dilator effects were observed experimentally in dogs. With 2 to 10 mg. per kg. intravenously coronary dilatation occurred within 2 to 3 minutes and was maintained for 60 to 200 minutes. The compound is said to exert a direct effect on the coronary vessels. The diuretic properties were studied in the rat and dog. In the rat daily urinary excretion was increased 20 to 80% after injections of 5 mg. given morning and evening. In man (10 subjects) it was found to exert a direct effect whether the diuresis initially was normal or diminished. In cardiac patients there was diminution of oedema. The dosage was 2 intravenous injections of 100 mg., one intramuscular injection of 200 mg. (given in polyvinylpyrrolidone), or 6 tablets of 50 mg. by mouth.

The effects on the pulmonary arterial pressure were observed in man by catheterization of the right chamber of the heart. In 25 subjects with a normal pressure of 13 to 20 cm. of water there was a fall in pressure of 6 cm. within 15 minutes. In patients with high pulmonary pressure (40 to 80 cm. of water) there was a fall of 20 to 40 cm. which was maintained for 30 to 45 minutes. These effects are said to be analogous to those obtained with digitalis or ouabain. *R. Wien*

2257. **Action of Various Pharmacologic and Other Agents on the Colon of Man**
W. J. GRACE, C. W. HOLMAN, S. WOLF, and H. G. WOLFF. *Archives of Surgery* [*Arch. Surg., Chicago*] **61**, 1036–1051, Dec., 1950. 6 figs., 23 refs.

The effects of numerous agents on the exposed areas of colon of 4 human subjects were tested. In general it may be said that parasympathomimetic agents enhanced colonic function in terms of blood flow, mucus secretion, secretion of the enzyme lysozyme and contractile activity while sympathomimetic agents and those which blocked cholinergic impulses inhibited colonic function. Vasodilator agents provoked hyperemia of the colonic mucosa without necessarily stimulating contractile activity. Although the effect of an agent on a strip of muscle suspended in Ringer's solution is predictable and reproducible, it was not necessarily so when administered to the intact human being.

The response of the colon to the agents tested apparently depended on whether they re-enforced or opposed other forces acting on the colon at the same time. Strong impulses acting on the bowel as part of the reaction of the individual to his environment were often powerful enough to outweigh the pharmacologic effects of even large doses of the administered agent. In some instances the response to a drug was variable in degree or direction and at times inconsistent with what is known of the pharmacological properties of the agent.—[From the authors' summary.]

2258. **Studies on Five Long-acting Choleretics**
D. L. COOK, R. G. BIANCHI, W. E. HAMBOURGER, and D. M. GREEN. *Journal of Pharmacology and Experimental Therapeutics* [*J. Pharmacol.*] **100**, 421–428, Dec., 1950. 4 figs., 9 refs.

The choleretic actions of five propionic acid derivatives were compared with those of dehydrocholic acid in anaesthetized dogs with biliary fistulae. A dose of 20 mg. per kg. body weight of dehydrocholic acid was used as a reference standard. The other drugs were given in amounts approximately equitoxic and equivalent to 0·014 of their intraperitoneal LD 50 in mice.

By the intravenous route, such doses caused a prompt increase in bile flow which was maximal in one hour. One of the compounds under test, β-(2 : 4-dimethoxy-5-*cyclo*hexylbenzoyl) propionic acid (SC-2644) produced a greater flow of bile than dehydrocholic acid and the flow

was still high 9 hours after its administration. The increased bile flow caused by dehydrocholic acid had returned to normal 2 hours after the drug was given. Two of the other compounds, β-(2 : 4-dimethoxy-5-*cyclo*pentylmethylbenzoyl) propionic acid (SC-2798), and β-(1-methoxy-4-naphthyl) propionic acid (SC-1749) produced a maximal flow in one hour which approximated to that caused by dehydrocholic acid, but took 9 hours to return to normal with SC-2798, and 5 hours with SC-1749. The bile flow was slightly increased by β-(2:4-dimethoxy-5-benzyl-benzoyl) propionic acid (SC-2657) and took 8 hours to return to normal. One compound, β-(2-methoxy-5-*cyclo*hexyl-benzoyl) propionic acid (SC-2292) did not affect the bile flow. All the compounds caused a decrease in the concentration of biliary total solids.

The intraduodenal injection of doses equimolar to 20 mg. of dehydrocholic acid per kg. body weight produced responses comparable with those obtained by intravenous injection. *P. A. Nasmyth*

2259. **Experimental and Clinical Evaluation in Man of Hexamethonium (C6), a New Ganglionic Blocking Agent**
F. A. Finnerty and E. D. Freis. *Circulation* [*Circulation*] **2**, 828–836, Dec., 1950. 6 figs., 20 refs.

Hexamethonium (C6) was administered in doses of 50 mg. intravenously to a heterogenous group of subjects (normal or suffering from various diseases of the vascular system). Sympathetic vasopressor responses were inhibited or abolished. Digital skin temperature, blood flow, and pulse volume increased. The rise in skin temperature was greater than that following "priscoline" (50 mg. intravenously) or tetraethylammonium (400 mg.). Reduction in arterial pressure was negligible in supine normal subjects, but more marked, though variable, in hypertensive patients, severe postural hypotension often resulting. Two patients with angina pectoris developed anginal attacks during hypotensive reactions. The duration of action of the drug after intravenous injection was 1 to 2 hours. After oral or sublingual administration it was ineffective. Paraesthesiae, palpitation, flushing, or nausea was not observed. *R. A. Gregory*

2260. **A Study of a Depressor Principle of *Veratrum viride***
A. G. Zupko and L. D. Edwards. *Journal of the American Pharmaceutical Association* [*J. Amer. pharm. Ass. (Sci. ed.)*] **39**, 610–615, Nov., 1950. 4 figs., 11 refs.

A tentative extraction procedure for the isolation of a noncrystalline, ether–water soluble, long-acting depressor principle from *Veratrum viride* has been presented. The ability of the depressor principle to lower blood pressure has been adequately demonstrated on five species of animals—the dog, cat, rabbit, rat, and rooster. Intramuscular injection of the depressor principle in dogs results in a gradual lowering of blood pressure, no respiratory embarrassment, and prolonged duration of activity due to slow absorption. The heart rate was slowed with the depressor principle only when the central nervous system was intact, indicating a central or neurogenic action since the heart rate was not slowed in the isolated heart of pithed turtles and frogs. Perfusion experiments on the hind-leg of rabbits and frogs indicated little, if any, direct vasodilatation. The LD 50, as calculated by the graphic method of DeBeer for the depressor principle injected subcutaneously in rats, was found to be 1·59±0·0102 mg. per kg.; injected intravenously it was found to be 0·273±0·0104 mg. per kg. In mice the subcutaneous LD 50 was found to be 1·12± 0·10245 mg. per kg.

Histopathologic studies on rats and rabbits indicated there was little effect on the organs except for the kidney and spleen. The paucity of splenic pulp and the varying degrees of granular degeneration were the outstanding changes observed.

The mechanism of action of the vasodilator response exhibited by the depressor principle has not been fully clarified. It appears to be of a central or reflex neurogenic nature.—[Authors' summary.]

2261. **Intramuscular Heparin**
D. G. Abrahams. *British Medical Journal* [*Brit. med. J.*] **2**, 1418–1419, Dec. 23, 1950. 3 figs., 2 refs.

Intramuscular injection of 35,000 to 40,000 units of a suitable aqueous solution of heparin maintained a delay in clotting time of 2 minutes or over for 12 hours in 20 patients. Clotting time was estimated by the method of Dale and Laidlaw. A delay of 2 minutes was the average found in 16 normal subjects 60 minutes after 100 units of heparin per kg. body weight intravenously; this was considered a satisfactory therapeutic level. A 12-hourly maintenance dose of 25,000 units kept the clotting delay over 2 minutes for 4 days.

To prevent pain at the site of injection 1 to 1·5 ml. of 1% procaine was mixed with the heparin in the injection syringe. A fine gauge (18–20) needle was used to reduce the incidence of haematoma at the site of injection.
D. Verel

2262. **Shortening of Bleeding Time by a Water-soluble Adrenochrome Derivative**
H. Sobotka and N. Adelman. *Proceedings of the Society for Experimental Biology and Medicine* [*Proc. Soc. exp. Biol., N.Y.*] **75**, 789–791, Dec., 1950. 1 fig., 8 refs.

The oxidation products of adrenaline, adrenochrome and adrenalone, have the power of shortening the bleeding time, but since the first is relatively insoluble and unstable a more suitable product, the trimethylammonium-acethydrazone hydrochloride of L-adrenochrome (T.A.L.) has been prepared for clinical investigation.

After test doses by mouth had produced no ill effects, 50 children between the ages of 2 and 16 undergoing tonsillectomy were selected, every third child being used as a control. The bleeding time was determined by the method of Ivy, and immediately before operation a dose of 10 mg. T.A.L. was given intramuscularly. When measured again between 3½ and 6 hours after operation, the bleeding time was shortened by an average of 49% in 25 cases. The remaining 7 did not respond and it was significant that their initial bleeding time averaged 2

minutes as compared with 4 minutes in the responsive group. Bleeding time had returned to normal on the third post-operative day, and that of the 18 controls remained constant throughout the period of observation.

A. Paton

CHEMOTHERAPY

2263. **Influence of Antibiotics and Sulfonamides on the Mortality and Bacteria of Experimental Peritonitis**

H. A. ZINTEL, H. H. ZINSSER, W. RUNYON, G. L. JACKSON, A. C. NICHOLS, M. M. WILEY, and W. J. WILLIAMS. *Surgery, Gynecology and Obstetrics* [*Surg. Gynec. Obstet.*] **91**, 742–750, Dec., 1950. 2 figs., 8 refs.

Penicillin therapy alone over a period of 10 days was as effective as a combination of penicillin and streptomycin or a combination of penicillin, streptomycin, and sulfonamides in the treatment of experimentally produced peritonitis in dogs. Streptomycin alone did produce a decreased mortality as compared to the control dogs; however, the results were definitely inferior to those with penicillin alone, with a combination of penicillin and streptomycin, or with a combination of penicillin, streptomycin, and sulfonamides.

Death or survival of the dogs in any given group could not be correlated with a difference in the initial or terminal number of bacterial types or strains present in the peritoneal cavity. Frequently new forms of bacteria which were not present in the initial cultures of the peritoneal cavity were found on terminal cultures. From the available bacteriological data it was not possible to designate one bacterial organism or any combination of the three most commonly encountered bacterial organisms (*Escherichia coli*, *Streptococci*, and *Clostridia*) as being responsible for the mortality of the peritonitis in these dogs.

Of the six most commonly found bacterial organisms it was not possible to predict the result of penicillin or penicillin and streptomycin therapy on the basis of the antibiotic sensitivities of the bacterial organisms found in the initial cultures. Bacterial organisms sensitive to the antibiotics used for treatment were frequently found in the peritoneal cavity on terminal culture both in the animals that lived and those that died.

Preoperative treatment with distemper vaccine and specific therapy for intestinal parasites did not alter the mortality of experimentally produced peritonitis.—[Authors' summary.]

2264. **Studies Relative to the Chemotherapy of Bacterial Endocarditis**

M. H. NATHANSON and R. A. LEIBHOLD. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1224–1231, Nov., 1950. 2 figs., 6 refs.

Before the general employment of penicillin it was possible, in the course of malignant endocarditis, to sterilize the circulating blood with sulphonamides, but the malady was always fatal, and at post-mortem examination it was found that the morbid process was still flourishing in the inflamed valves. A number of experiments and investigations have been made in many quarters to show that the poor prognosis of malignant endocarditis before the days of penicillin was not due to any special virulence on the part of the organism concerned, nor was it due to any inherent or temporary frailty of the patient. It was soon clear that sulphonamides could not penetrate the diseased and thrombotic tissue harbouring the organisms on the valves, and that the barrier to the action of sulphonamides was fibrin covering the diseased tissue like a varnish. Fibrin does not inhibit sulphonamides, but sulphonamides cannot penetrate fibrin. The barrier is physical, not biochemical. With penicillin there is no such difficulty. Fibrin neither inhibits the action of penicillin nor does it offer any physical barrier to penetration. Very much the same may be said of streptomycin, with clinical implications of considerable importance, in penicillin-resistant malignant endocarditis.

G. F. Walker

2265. **Promizole: Factors Determining Adequate Dosage**

R. L. NEMIR, I. SCHULMAN, and H. CLEMONS. *American Review of Tuberculosis* [*Amer. Rev. Tuberc.*] **62**, 618–631, Dec., 1950. 7 figs., 21 refs.

In early studies on "promizole", it was apparent that the dose necessary to maintain therapeutic blood concentrations (1 to 2 mg. per 100 ml.) varied enormously with different patients. The difference is not in rate of absorption from the gastro-intestinal tract or of urinary excretion, in tissue storage, or in rate of drug destruction. Unless the dose is ascertained for each individual patient an appreciable number of patients will receive inadequate amounts if the calculation is made by age or weight.

Kenneth Marsh

2266. **A New Antifungal Principle Produced by *Streptomyces fradiae***

W. E. WOOLDRIDGE and M. HOFFMAN. *Journal of Investigative Dermatology* [*J. invest. Derm.*] **15**, 351–353, Nov., 1950. 1 fig., 2 refs.

Discovery of a new antifungal principle of *Streptomyces fradiae* is presented. This antibiotic is effective *in vitro* against several aerobic actinomyces as well as many of the "deep" fungi. The dermatophytes and two yeast-like organisms are not affected. This antibiotic is thought to be entirely different from the original neomycin (Waksman and Lechevalier, *Science*, 1949, **109**, 305–307) and from the more recently discovered fracidin.

James Marshall

2267. **On a New Antibiotic, Griseolutin, Produced by *Streptomyces*.** [In English]

H. UMEZAWA, S. HAYANO, K. MAEDA, Y. OGATA, and Y. OKAMI. *Japanese Medical Journal* [*Jap. med. J.*] **3**, 111–117, April, 1950. 1 fig., 8 refs.

A new antibiotic, griseolutin, has been obtained from an organism, *Streptomyces griseoluteus*, found in soil near Tokyo. The broth is extracted with ethyl acetate at *p*H 2·0 and the extract is passed through a column of aluminium oxide. The antibiotic is isolated in the form of yellow-coloured needle-shaped crystals: it is insoluble in water. Its toxicity is low, and a subcutaneous injection of 10 mg. into mice of 10 g. body weight has no

toxic action. By the agar-streak method strains of *Staphylococcus aureus* are inhibited in dilutions of 1 in 1,280,000 to 1 in 5,720,000; *Bacillus subtilis* 1 in 5,120,000; *Bacillus anthracis* 1 in 2,560,000; *Proteus vulgaris* 1 in 5,120,000; *Brucella melitensis* 1 in 2,560,000; and *Bacterium coli* 1 in 160,000. Streptomycin-resistant, streptothricin-resistant, and grisein-resistant *Bact. coli* are equally susceptible to griseolutin. Griseolutin differs in composition from aureomycin since it does not contain chlorine: aureothricin contains sulphur, as does luteomycin. *G. M. Findlay*

2268. **Procaine Penicillin Administered Orally: Comparison with Sodium Penicillin**
W. P. Boger and J. O. Beatty. *Journal of Investigative Dermatology* [*J. invest. Derm.*] **15**, 373–379, Nov., 1950. 5 figs., 6 refs.

It is demonstrated that there is no statistical difference in the plasma concentrations or urinary recovery of penicillin when sodium and procaine penicillins are given orally to the same subjects at dosage levels of from 500,000 to 1,000,000 units. The absorption of procaine penicillin orally administered in liquid suspension was little different from that after administration of rapidly disintegrating tablets. *James Marshall*

2269. **Two-hour versus Three-hour Administration of Crystalline Penicillin G. The Treatment of Early Syphilis**
H. N. Bundesen, J. Rodriquez, and G. X. Schwemlein. *Journal of Laboratory and Clinical Medicine* [*J. Lab. clin. Med.*] **36**, 759–762, Nov., 1950. 2 figs., 2 refs.

In this investigation 184 patients with dark-field positive primary and secondary syphilis received 2·4 mega units of aqueous penicillin G over a period of 7½ days. The penicillin was administered 2-hourly. There was no significant difference between the failure rate with this method of administration and the failure rate when the same total dosage of penicillin was given 3-hourly. *A. W. H. Foxell*

2270. **A Clinical Appraisal of Neomycin**
B. A. Waisbren and W. W. Spink. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1099–1119, Nov., 1950. 8 refs.

Neomycin is an antibiotic derived from a strain of streptomycetes closely related to *Streptomyces fradiae*. It is a basic compound, and is heat-stable and resistant to a *p*H of 2·0 at 100° C. It has been shown to be bactericidal *in vitro* against a wide variety of both Gram-positive and Gram-negative organisms. This paper, which comes from the University of Minnesota Hospitals, records the results of a trial of neomycin on 63 patients with infections due to different types of organisms, including *Mycobacterium tuberculosis* and *Proteus vulgaris*; 17 cases are reported in detail. In most instances the patient was given intramuscular injections 4 times a day of 0·5 g. of neomycin dissolved in 2 ml. of physiological saline. The drug was well tolerated when administered orally in doses of 2·0 g. every 6 hours, but comparatively low concentrations were found in the blood when this method was employed.

In none of the 7 cases of tuberculosis was there any evidence of a beneficial effect of neomycin. The drug was effective in eradicating *P. vulgaris* from the urine in 16 out of 17 cases, although in 3 of them *P. aeruginosa* was subsequently isolated. In 8 out of 11 cases of urinary-tract infection due primarily to *P. aeruginosa* the urine was rendered sterile. Neomycin also appeared to be effective against other Gram-negative organisms. In no case did neomycin-resistant variants appear during treatment.

Out of 32 patients whose urine was examined serially, fine granular casts were found during or just after neomycin therapy in 24 cases, accompanied in some by a rise in blood urea nitrogen level. The post-mortem appearance of the kidneys was studied in 5 cases and in only one was tubular damage found. As in this case promizole, streptomycin, and sulphadiazine had also been administered it was not established that neomycin was the toxic agent. There were 5 cases in which neomycin exerted a direct toxic effect on the eighth cranial nerve, the auditory portion being attacked before the vestibular portion in each case. The authors conclude that " in view of the ototoxic and nephrotoxic effects of neomycin this drug cannot be recommended for general use."

[As 22 of the patients were over 60 years of age and many already had evidence of kidney disease it is possible that fewer toxic effects would occur if the drug were given in lower dosage and to a more select group of patients.] *A. W. H. Foxell*

TOXICOLOGY

2271. **Treatment of Acute Barbiturate Poisoning. A Comparison of Nikethamide and Amphetamine**
J. Riishede. *Lancet* [*Lancet*] **2**, 789–792, Dec. 16, 1950. 17 refs.

Of 193 cases of barbiturate poisoning, the first 61 were treated with nikethamide and the remainder with amphetamine. In all, the stomach was washed out, and charcoal and magnesium sulphate solution were left in that organ. Peristalsis was stimulated by 1-mg. doses of neostigmine 4-hourly. Sulphonamides and/or penicillin were given as a prophylactic measure against pneumonia. At least 2 to 3 litres of fluid was given parenterally daily to maintain the fluid balance. The dose of nikethamide employed was 10 ml. intravenously and 10 to 15 ml. intramuscularly, followed by 5 to 20 ml. hourly [by unstated route] as the patient's response indicated. The dosage of amphetamine was 20 to 50 mg. intravenously at once, according to the depth of narcosis, followed by 50 mg., generally intramuscularly, per hour or, rarely, 100 mg.

The results are shown with division into slight and severe cases, based on the objective state of the patient and regardless of the amount and nature of the drug swallowed. Figures given show that there were no deaths in the slight cases. With nikethamide, there were

27 deaths out of 43 severe cases (63%), and with amphetamine 12 out of 58 (21%). Further, side-effects were very much commoner with nikethamide, shock, vomiting, and motor stimulation of the central nervous system being the most prominent. The cases in the two series showed a similar age distribution, and there was little difference in the type and amount of drug consumed, or in the time lag before treatment was instituted. It is thought, therefore, that the two series are comparable.

It is concluded that amphetamine is greatly to be preferred to nikethamide in the treatment of acute barbiturate poisoning. [It would be of great interest to have a similar comparison between picrotoxin and amphetamine.] *Reginald St. A. Heathcote*

2272. **A Fatal Case of Aplastic Anemia following Chloramphenicol (Chloromycetin) Therapy**
M. L. RICH, R. J. RITTERHOFF, and R. J. HOFFMANN. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1459–1467, Dec., 1950. 17 refs.

The case is reported of a patient who was treated for 3 months for pyuria by administration of 0·25 g. of chloramphenicol every 8 hours. He developed a severe anaemia and decrease of blood platelets with an extensive purpuric rash. After death the main pathological changes were found in the lungs which were very oedematous, the bronchi being filled with coagulated protein and erythrocytes. Focal necroses were present round many bronchi and bronchioles. There was a marked reduction of haematopoietic elements in the sternal marrow. Only small amounts of other drugs were given and these were not of a kind likely to cause such a condition, which the authors attribute to the nitrobenzene group in the chloramphenicol molecule.
V. J. Woolley

2273. **Severe Polyneuritis following Gold Therapy for Rheumatoid Arthritis**
J. B. DOYLE and E. F. CANNON. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1468–1472, Dec., 1950. 10 refs.

A patient developed polyneuritis after receiving 100 mg. of " myocrisin " each week for 9 weeks. The symptoms consisted of tingling in the extremities with muscular weakness and incoordination. The cerebrospinal fluid was normal. The condition became worse for about a month after administration of myocrisin ceased and thereafter gradually improved, with complete recovery by 4 months later. *V. J. Woolley*

2274. **An Experimental Study of Cocaine Intoxication and its Treatment**
J. E. STEINHAUS and A. L. TATUM. *Journal of Pharmacology and Experimental Therapeutics* [*J. Pharmacol.*] **100**, 351–361, Nov., 1950. 4 figs., 14 refs.

The usual cause of death in rabbits and dogs following administration of cocaine was respiratory failure but, at some intermediate rates of intravenous injection, cardiac arrest seemed to precede the stoppage of respiration. Adrenaline and other sympathomimetic agents counteracted the cardiovascular depression to a certain extent. Adequate protection against the toxic effects of cocaine was produced by approximately one-half the anaesthetic dose of pentobarbitone.

It is concluded that the action of barbiturates in mitigating the effects of cocaine " is limited to the control of the central stimulating effects of the toxic process and doses above that necessary to control the convulsions increase the possibility of respiratory failure ".

[The evidence for this last statement is very slight.]
John R. Vane

2275. **Evidence for Conversion of Carbon Monoxide to Carbon Dioxide by the Intact Animal**
R. T. CLARK. *American Journal of Physiology* [*Amer. J. Physiol.*] **162**, 560–564, Sept., 1950. 12 refs.

This is a study of the rate of oxidation of carbon monoxide to carbon dioxide in the animal body. Turtles and mice were used as experimental animals, the technique being essentially the same in each case. The animals were exposed in a sealed container to a known low concentration of carbon monoxide. The carbon dioxide produced was absorbed in sodium hydroxide solution and was replaced by pure oxygen through a one-way valve. At the end of the experimental period the carbon monoxide concentration was measured. The animals were removed. The apparatus was again set up with the original carbon monoxide concentration, left for the same period, and the carbon monoxide oxidization in the absence of animals then determined. It was found that with experimental periods of 8 to 13 days turtles consumed 30 to 50% of the carbon monoxide. With mice in a 4-day experimental period the carbon monoxide disappeared at a rate of 0·24 c.mm. per g. body weight per hour. In two experiments the carbon monoxide added to the atmosphere contained labelled carbon. It was found that in 3 days, 22·3% and 19% of the radioactive carbon was converted to carbon dioxide by mice, the consumption rate being 0·28 c.mm. per g. body weight per hour. *R. P. Foggie*

2276. **Oral Trichlorethylene Poisoning and its Pathogenesis.** (Die perorale Trichloräthylenvergiftung und ihre Pathogenese)
H. GRABER. *Deutsche Zeitschrift für die Gesamte Gerichtliche Medizin* [*Dtsch. Z. ges. gerichtl. Med.*] **40**, 88–121, 1950. 2 figs., 17 refs.

The author describes 7 fatal cases of trichlorethylene poisoning. Brain, liver, lungs, and gastro-intestinal canal were the organs principally affected. The last showed the picture of an acute, haemorrhagic, membranous inflammation. A distinct aromatic smell was noticed in the brain at necropsy. The leptomeningeal and intracerebral vessels were intensely congested. Congestion and oedema of the lungs were the only other macroscopic features of note. Histologically, the myelin sheets showed club-like swelling and fatty degeneration, which was particularly marked in both hemispheres and is regarded by the author as pathognomonic. There was fatty degeneration also of the glia cells, and fat was demonstrable within the endothelial and adventitial cells of the blood vessels. In the liver the main changes were

dissociation of the cells with moderate degeneration and diffuse fatty infiltration, while extravasation of blood plasma had caused marked compression of trabeculae. Similar changes were observed in experiments with guinea-pigs. *R. Salm*

2277. **Pathological Histology of Acute Benzene Poisoning. Observations on Primary Lipoid Formation in the Brain.** (Zur pathologischen Histologie nach akuter Benzinvergiftung. Ein Beitrag zur primären toxischen Lipoidbildung im Gehirn)
H. KLEIN. *Deutsche Zeitschrift für die Gesamte Gerichtliche Medizin* [*Dtsch. Z. ges. gerichtl. Med.*] **40**, 76–87, 1950. 5 figs., 33 refs.

A case of fatal benzene poisoning following accidental ingestion is described. Pathologically the condition is characterized by congestion and haemorrhagic oedema of the lungs, fatty degeneration of voluntary muscles, dissociation, pericapillary oedema and fatty degeneration of the liver, and fatty degeneration of the convoluted tubules of the kidney. The brain and spinal cord show a generalized fatty degeneration of ganglion and glia cells, associated with fatty infiltration of the endothelial cells of their blood vessels, accompanied by perivascular oedema. No degeneration of myelin sheaths was observed. After 24 hours, benzene poisoning could no longer be demonstrated chemically. *R. Salm*

2278. **The Effect of Smoking upon Blood Flow in the Sympathectomized Limb**
S. I. RAPAPORT, H. A. FRANK, and T. B. MASSELL. *Circulation* [*Circulation*] **2**, 850–858, Dec., 1950. 5 figs., 19 refs.

A study was made of the effect of smoking on the skin temperature and blood flow in normal and sympathectomized limbs, skin thermocouples and a venous-occlusion plethysmograph being used. Sympathectomy was found to abolish the peripheral vasoconstriction produced by smoking. No difference was observed in the response of patients sympathectomized for thromboangiitis obliterans, arteriosclerosis, or severe vasospasm. *R. A. Gregory*

2279. **Sodium Ethanemonothiophosphonate. A Weak Antidote to Mustard Gas**
E. R. HOLIDAY, J. ST. L. PHILPOT, and L. A. STOCKEN. *Biochemical Journal* [*Biochem. J.*] **47**, 637–639, Nov.–Dec., 1950. 7 refs.

INDUSTRIAL TOXICOLOGY

2280. **Experimental Ethylene Oxide Human Skin Injuries**
R. J. SEXTON and E. V. HENSON. *Archives of Industrial Hygiene and Occupational Medicine* [*Arch. industr. Hyg. occup. Med.*] **2**, 549–564, Nov., 1950. 12 figs., 11 refs.

Some recent experimental work dealing with the action on the human skin of concentrated ethylene oxide and various aqueous dilutions is described in detail. Although previous workers had recorded difficulty in producing skin damage with this substance, it had been noticed that where the concentrate or dilute solutions were kept in close contact with the skin by shoes, gloves, and other articles of clothing, burns had resulted. The ideal conditions for the production of such burns seemed to be intimate skin contact accompanied by some impediment to evaporation. Special attention has been given to a description of experimental technique, the charting of the time–concentration relationship, the clinical course of a typical burn, and sensitivity phenomena.

In describing the ethylene oxide burn, the authors point out that it differs in some respects from that produced by thermal or ordinary chemical agents in that there is a latent period before erythema and vesiculation occur, that there is large bleb formation, and that in the later stages desquamation and pigmentation result. In fact the burns closely resemble those produced by mustard gas. The accepted end-point in these experiments was a minimal second-degree burn as shown by vesiculation on an erythematous base. It was clearly shown that 50% concentrations of ethylene oxide were the most harmful to the human skin. More concentrated solutions prevent efficient skin absorption. During the course of the experiments, out of a total of 8 subjects 3 became sensitized, and uniformity in the incubation period was observed. The possible factors governing sensitization are briefly discussed.

The authors also observed the effect of spraying the skin with ethylene oxide followed by rapid evaporation; it was found that a freezing reaction resulted similar to that produced by ethyl chloride. *A. Thelwall Jones*

2281. **Comparative Toxicity of Five Glycerol Ethers**
C. H. HINE, P. LOEB, and H. H. ANDERSON. *Archives of Industrial Hygiene and Occupational Medicine* [*Arch. industr. Hyg. occup. Med.*] **2**, 574–581, Nov., 1950. 8 refs.

Recently, increased interest has been focused on the glycerol ethers because of their potential industrial application as solvents, plasticizers, surface-active agents, and stabilizers. A review of the literature gave little information about the toxicity of these substances and the authors therefore carried out a series of animal experiments to assess the pharmacological actions of certain members of the glycerol-ether group.

Five of the glycerol ethers were investigated—namely, α-ethyl, α-*iso*propyl, α-allyl, α-phenyl, and α:γ-di*iso*propyl. A comparative table of their chemical and physical properties is shown. None of the ethers produced any significant mortality in mice exposed to air saturated with their vapours for long periods. In hamsters thoroughly wetted with each of the ethers by means of a fine spray, no pharmacological effect was observed. All five ethers were found to be practically non-toxic with respect to their percutaneous absorption, and were devoid of any serious damaging effects to the intact skin. Instillation into the eyes of rabbits failed to produce evidence of corneal ulceration with any of the agents. The α-ethyl and α-*iso*propyl derivatives were considered almost non-toxic after ingestion, the α-allyl, α-phenyl, and α, γ-di*iso*propyl falling into the slightly toxic class.

The authors conclude that, apart from accidental ingestion, the glycerol ethers are unlikely to cause poisoning through normal industrial application.

A. Thelwall Jones

2282. **The Effects of Sodium Citrate in Lead Poisoning and Lead Absorption: Lead Poisoning**

D. O. Shiels, W. C. Thomas, and G. R. Palmer. *Medical Journal of Australia* [*Med. J. Aust.*] **2**, 886–892, Dec. 16, 1950. 6 figs., 11 refs.

The authors treated 10 cases of lead poisoning with 4 or 5 g. of sodium citrate in 2 oz. (56 ml.) of water three times a day. A rapid decrease in the symptoms and an improvement in the general clinical condition occurred. Blood films were examined before treatment began and weekly thereafter. There was a substantial rise in the ratio of large lymphocytes and monocytes to small lymphocytes soon after the treatment started, and the ratio continued to increase for some days, eventually falling to about the values which are found in non-exposed persons.

The effects on stippling were not consistent in the earlier stages of the treatment. In some cases the stippled-cell count increased, but in the majority there was a rapid fall. Eventually, in times varying from about 2 weeks to 2 months, the counts returned to normal.

The urinary lead concentrations were determined before, and on samples collected every second day during, the course of the treatment. In all cases there was a substantial rise in the urinary lead excretion, which was maintained for varying times, but in the majority of cases the value 5 days after the treatment had started was still well above the initial value.

The authors consider that this is a valuable and simple method of treating lead poisoning and that it causes no unpleasant effects beyond slight nausea in some cases. It brings about an increase in the elimination of lead in the urine without concomitant exacerbation of symptoms.

K. M. A. Perry

2283. **The Effects of Sodium Citrate in Lead Poisoning and Lead Absorption: Lead Absorption**

D. O. Shiels, W. C. Thomas, and G. R. Palmer. *Medical Journal of Australia* [*Med. J. Aust.*] **2**, 922–928, Dec. 23, 1950. 6 figs., 7 refs.

This paper describes the results obtained in an investigation of the prophylactic use of sodium citrate by the employees in an accumulator factory. It was a new works with 48 employees who had not previously been exposed to lead. The concentration of lead in the urine, the stippled-cell count, and the ratio of large lymphocytes (with monocytes) to small lymphocytes increased as the magnitude of exposure increased, owing to increased atmospheric lead concentration and increased time of exposure. Blood and urine examinations were made at intervals of about 5 weeks.

After the works had been in operation for some months the workers were given 4 g. of sodium citrate in an oz. (28·4 ml.) of water a day. It was found that there was a significant difference in total stippled-cell counts and in the coarsely-stippled-cell counts before and after the start of the sodium citrate regimen, and also in the cell ratio, although the concentrations of lead in the atmosphere were the same. It therefore seems possible that the decrease in the cell ratio which followed the start of the taking of the citrate was caused by the increased elimination of lead in the urine brought about by the citrate. Further evidence to support this is provided by comparing those workers who each took the full dose of citrate with those who took less than 75% of the possible dosage. In the group taking all the available doses there was significant improvement in the results of laboratory tests, while the group which took only a few doses showed no such significant changes.

The prophylactic use of sodium citrate is helpful, but should not be regarded as an alternative to improvement of conditions respecting exposure to lead.

K. M. A. Perry

2284. **Toxicity of Sulfuric Acid Mist**

J. F. Treon, F. R. Dutra, J. Cappel, H. Sigmon, and W. Younker. *Archives of Industrial Hygiene and Occupational Medicine* [*Arch. industr. Hyg. occup. Med.*] **2**, 716–734, Dec., 1950. 10 figs., 5 refs.

In an endeavour to investigate the physiological effects of air containing droplets of sulphuric acid, several species of animal were exposed to mists of sulphuric acid produced by a nebulizer in a gas chamber. The particle size of the mists was between 1 and 2 μ. The concentration of sulphate ion in the chamber and the period of exposure were varied independently.

The results showed that guinea-pigs were the most sensitive animals used, being killed by a concentration of 0·087 mg. of sulphuric acid per litre, while rats, rabbits, and mice survived a period of 2·75 hours at this concentration. Rats and rabbits were less affected than mice, 0·699 mg. per litre for 7 hours being necessary to kill rats, whereas rabbits survived even higher concentrations. The principal pathological features were degenerative changes in the epithelium of trachea and bronchi, while the lungs showed hyperaemia, oedema, extravasation of blood, atelectasis, and emphysema. In general, the changes were more marked when higher concentrations had been administered.

Guinea-pigs were found to be more susceptible to mists of sulphuric acid than to mists of hydrogen chloride or fluoride. Rabbits, on the other hand, appeared to be equally affected by all three agents.

W. K. S. Moore

2285. **Acute Pulmonary Complications following Inhalation of Chromic Acid Mist. Preliminary Observations of Two Patients who Inhaled Massive Amounts of Chromic Acid**

J. B. Meyers. *Archives of Industrial Hygiene and Occupational Medicine* [*Arch. industr. Hyg. occup. Med.*] **2**, 742–747, Dec., 1950. 11 refs.

The literature on the chronic respiratory effects of chromic acid mist is briefly reviewed and 2 cases of acute poisoning following exposure to high concentrations of chromic acid mist, produced by boiling vats of a solution of the acid, are described. One of the patients was affected to a lesser degree than the other, but both developed pulmonary lesions characterized by cough

with purulent sputum, dyspnoea, and more or less severe chest pain persisting to the time this paper was written (about 18 months). Other features were anorexia, pyrexia, and temporary loss of weight. The radiological and bronchoscopic signs were insignificant. Perforation of the nasal septum and chrome ulceration of the skin were absent. *W. K. S. Moore*

THERAPEUTICS

2286. **Effects of Massive Transfusion and Hemorrhage on Blood Pressure and Fluid Shifts**

A. C. GUYTON, J. E. LINDLEY, R. N. TOUCHSTONE, C. M. SMITH, and H. M. BATSON. *American Journal of Physiology* [*Amer. J. Physiol.*] **163**, 529–538, Dec., 1950. 4 figs., 14 refs.

A study was made in anaesthetized dogs of the effect on the circulation of varying the blood volume by slow transfusion or haemorrhage. Increasing the blood volume to as much as 2·62 times the control value caused very little increase in blood pressure (up to 17 mm. Hg). At greater blood volumes the arterial pressure declined. After denervating the carotid sinuses and cutting both vagi the blood pressure on massive transfusion rose by as much as 54 mm. Hg. Spinal analgesia lowered the blood pressure to 50 mm. Hg. On subsequent massive transfusion it rose by about 20 mm. Hg. During a massive transfusion about 63% of transfused whole blood and 113% of transfused plasma was lost from the circulation. Slow haemorrhage failed to cause marked or rapid shifts of fluid between the interstitial fluid compartment and the blood. *R. A. Gregory*

2287. **Continuous Tetanizing (Low-voltage) Currents for Relief of Spasm. A Clinical Study of Twenty-seven Spinal Cord Injury Patients**

W. J. LEE, J. P. MCGOVERN, and E. N. DUVALL. *Archives of Physical Medicine* [*Arch. phys. Med.*] **31**, 766–771, Dec., 1950. 2 figs.

Various methods of drug therapy and of surgical intervention have been tried in the past to diminish muscle spasm in paraplegic patients, with little or no benefit. Following the observation that a short period of relaxation often came after brisk passive exercise of a spastic extremity the authors investigated the use of tetanizing currents to produce muscle relaxation. The currents used were faradic, sinusoidal, and a combination of sinusoidal and faradic currents. The currents were applied to the spastic muscle to be treated for an average time of fifteen minutes. The use of continuous tetanizing currents produced temporary relaxation, in varying degree, of muscle spasm in cases of cord injury. The average duration of relaxation ranged from 4 to 10 hours, being greatest when sinusoidal current followed faradic stimulation, and least with faradism only. The average degree of relaxation was most marked with sinusoidal and least with faradic current. In all subjects tested with a sinusoidal current erythema and sweating were noted between the electrodes and in the surrounding area. Burns varying from 2 to 6 sq. cm. in area occurred in 5 patients. Sloughing followed blistering in every case, with *Pseudomonas aeruginosa* as the main invader.

The authors use a sinusoidal current in cord-injury cases more or less as a routine, preliminary to muscle re-education. Improved technique has eliminated the danger of burns. They have also noted that good results are obtained when galvanic and sinusoidal currents are used simultaneously. The advantage of this combination is that less sinusoidal current is necessary to produce muscle tetanus. *M. H. L. Desmarais*

2288. **Liquefaction of Viscous Purulent Exudates by Deoxyribonuclease**

J. B. ARMSTRONG and J. C. WHITE. *Lancet* [*Lancet*] **2**, 739–742, Dec. 9, 1950. 3 figs., 33 refs.

Experiments *in vitro* and a few clinical observations have been made on reduction in the viscosity of purulent sputum and pleural exudates by the action of the enzyme deoxyribose nuclease (DN-ase) derived from ox pancreas. The enzyme acts on extracellular hydrated fibrils of deoxyribose nucleoprotein (DNP). When activated by magnesium or certain other ions it rapidly reduces the viscosity of DNP solutions, the action being apparently a depolymerization. DNP may constitute 30 to 70% of the total solids present in purulent pleural exudates and is often a more important cause of viscosity in such exudates than is fibrin.

In the experiments *in vitro* sputum smears were treated with DN-ase at 37° C. and by suitable staining methods disappearance of fibrils containing deoxyribose nucleic acid (DNA) could be demonstrated. Measurements of sputum viscosity were made with a special viscosimeter (Lucas and Henderson, *Arch. int. Pharmacodyn.*, 1936, **54**, 201). After incubation of the sputum for 2 hours at 37° C. with DN-ase its viscosity was reduced to 27% of that of an untreated specimen.

For tests *in vivo* varying strengths (0·05 to 0·5 mg. per ml.) of DN-ase were made up in M/50 $MgCl_2$ with 1% gelatin, Seitz-filtered, and stored in 5-ml. quantities at 5° C. until required. The solutions were then administered as a fine spray through a "deedon" inhaler. Only the higher concentrations appeared to give satisfactory clinical results. Bronchitic and bronchiectatic patients found their sputum easier to bring up, and cytochemical examination of the sputum showed disappearance of DNA fibrils. There were no toxic or anaphylactic effects from the inhalations, which could apparently be continued indefinitely. The DN-ase is not inhibited by concomitant penicillin or streptomycin therapy. One patient with a thick purulent pleural exudate was treated by intrapleural injection of DN-ase, with marked liquefaction of the pus. At subsequent operation the visceral pleura was not thickened to the same extent as is usual in empyemata. DN-ase is quite distinct from streptokinase, which liquefies fibrin and which has been used in similar fashion and with similar encouraging results. [A combination of the two enzymes would seem worth a trial.] *John Forbes*

Medical Jurisprudence

2289. **Fingerprint Detection and Mercury Poisoning**
T. H. BLENCH and H. BRINDLE. *Lancet* [*Lancet*] **1**, 378–380, Feb. 17, 1951. 3 refs.

Previous work on mercury poisoning and finger-print detection is critically reviewed, and the conclusion is reached that condemnation of such a world-wide procedure as the use of mercury with chalk for finger-print detection is not justified on the evidence presented. Two police officers, one with 12 years' experience and the other with 9 years' experience in "dusting", provided 24-hour specimens of urine, collected at intervals over a few months, for determining whether the absorption of mercury, judged by the excretion, could be related to the amount of work done. No symptoms or signs of mercury poisoning were found in either volunteer. The specimens of urine were taken during ordinary working periods. In the first 6 weeks of the investigation no special precautions were taken and an average daily excretion of 425 μg. was found in the urine of the first officer, while that in the second subject averaged 152 μg. The higher figure in the first was probably due to the fact that he performed duties in civilian clothes, visiting the scenes of crime during the day with, probably, further absorption from the clothes he continued to wear. The excretion fell to 85 μg. after 6 days' holiday in the case of the first man and to 53 μg. after 4 days' holiday in the second. For a week both men wore overalls and carefully washed after using the powder; the figure for the first man was less than half the previous average, and for the second it was two-thirds. Two further samples taken 15 days and 35 days after the start of these simple precautions gave very low figures.

These figures may be compared with an excretion of 21 μg. in persons with no known contact with mercury and also with the fact that a common medicinal dose is 1 gr. (64,800 μg.) weekly for 12 weeks. It is concluded that "before the use of mercurial powder . . . is considered as representing a definite risk, fairly protracted observations should be made on each of a large number of people who are prepared to exercise care in taking simple hygienic measures. There is some evidence that the urinary excretion of mercury can be used to supply information about the amount ingested."

R. Hodgkinson

2290. **Medicolegal Identification of Seminal Stains using the Acid Phosphatase Test**
F. LUNDQUIST. *Archives of Pathology* [*Arch. Path.*] **50**, 395–399, Oct., 1950. 9 refs.

The only absolute proof of the presence of semen in a stain is the finding of intact spermatozoa in the extract. There are various circumstances in which this may be difficult; for example, the person concerned may be suffering from aspermia, the stain examined may be from a part of the ejaculate normally containing few or no spermatozoa, or the sperm may be difficult to release from the stained fabric. The author suggests that, as prostatic secretion contains a very high concentration of acid phosphatase, the estimation of the acid-phosphatase content of the stain may be used as a specific test for semen, the fabric being extracted with a known volume of water and the acid-phosphatase content of the extract estimated colorimetrically. The author has used the test for 6 years and has tried it on some 2,000 stains. It was found that the acid-phosphatase test may sometimes be negative even though spermatozoa are demonstrable in the stain extract. This was so in 8 out of a series of 49 cases. Moreover, acid phosphatase may disappear with storage, may be destroyed by chemicals in the textile, or may be present in the semen only in small amounts, as in subjects with chronic prostatitis. On the other hand, in 12 cases out of 32 no spermatozoa were found, though the acid-phosphatase content was above the critical level. Thus while the author has sufficient confidence in the acid-phosphatase test to be prepared to label any stain giving a positive result as seminal, the test should be regarded as supplementary to the microscopical demonstration of spermatozoa and not as replacing it.

Gilbert Forbes

2291. **The Post-mortem Behaviour of Blood (Observations on Pharmacology and Enzymology of Blood after Death from Various Causes, Especially Suffocation).** (Das postmortale Verhalten des Blutes. (Beiträge zur Pharmakologie und Fermentkinetik des Blutes bei verschiedenen Todesursachen, insbesondere der Erstickung))
S. P. BERG. *Deutsche Zeitschrift für die Gesamte Gerichtliche Medizin* [*Dtsch. Z. ges. gerichtl. Med.*] **40**, 1–75, 1950. 25 figs., bibliography.

The author outlines the following chain of reactions culminating in the rapid and complete post-mortem liquefaction of the initially coagulated intravascular blood, as observed in cases of asphyxia and fatal haemorrhage. These causes of death are accompanied by a sudden outpouring of adrenaline into the circulation, which is followed by a steep rise in the blood phospholipid level. These substances combine with anti-fibrinolysins present in the blood, and the uninhibited fibrinolysins liquefy the blood, which normally coagulates very soon after death. A sudden rise in blood phospholipids is also observed in cases of acute lipaemia following blunt trauma, or in phosphorus poisoning. Another substance accelerating fibrinolysis owing to its catalytic properties is urea. The author makes a distinction solely between completely fluid blood on the one hand, and partially or predominantly clotted post-mortem blood on the other, and asserts that in cases of true and sudden asphyxia the blood is always completely fluid at necropsy.

R. Salm

Radiology

2292. **A Method of Locating the Placenta in the Intact Human Uterus by means of Radio-active Sodium**
J. C. McCLURE BROWNE and N. VEALL. *Journal of Obstetrics and Gynaecology of the British Empire* [*J. Obstet. Gynaec. Brit. Emp.*] **57**, 566–568, Aug., 1950. 6 refs.

The authors describe an entirely new method for the exact location of the placenta. Methods hitherto used have been found tedious, and in many instances false results have been obtained by the inexpert clinician and radiologist. The authors, for purposes of research at the British Postgraduate Medical School, required specimens of placental blood, and for this purpose needed accurately to locate the placenta.

The method consists in injecting 50 μc. of radioactive sodium (^{24}Na), in a vehicle of sterile isotonic saline solution, into an antecubital vein. After about 30 seconds, during which time the ^{24}Na mixes with the blood, radioactivity measurements are made over the abdominal region. For this purpose a counter tube, without shield but with its window screened to prevent entry of particles, is used in conjunction with a counting-rate meter. The counting rate over the area of the uterus and other regions is measured with the end of the counter tube in contact with, and with its axis normal to, the skin. As reference level the counter is frequently placed over the heart, the counting rate over the uterus being about half to two-thirds of that over the heart. There is a rapid decrease towards the lower uterine pole, and over the lower segment the rate is only one-fifth of that over the heart. If the placenta is situated on the anterior wall of the uterus its site is indicated by a considerably higher counting rate, which closely approaches that found over the heart. The absence of a region of high counting rate indicates that the placenta lies on the posterior wall.

These results were confirmed by Caesarean section, manual removal of the placenta, or free aspiration of blood from the supposed placental site. Out of 34 cases the results were found to be correct in 31. In one case of intra-uterine death no indication of the placental site could be obtained at all, " suggesting that the maternal placental circulation had shut down completely ". High counting rates were noted at times over the lower segment; this finding strongly suggests placenta praevia, but failure to obtain high counting rates does not exclude the presence of a low placenta.

The total amount of radiation received by the patient was approximately 0·1 r, which is the permitted maximum daily dose of radiation and less than that received by the patient if the placenta is located by other methods.

[The abstracter envisages the application of this method in the detection and exact location of placenta praevia, either by the use of counter tubes which can be sterilized and introduced into the vagina (when a very high reading should be obtained) or by the production of radioautographs by means of a large film in a rubber cassette moulded for a number of hours to the patient's abdomen.] *J. Rabinowitch*

2293. **Protective Action of Anoxic Anoxia against Total Body Roentgen Irradiation of Mammals**
A. H. DOWDY, L. R. BENNETT, and S. M. CHASTAIN. *Radiology* [*Radiology*] **55**, 879–885, Dec., 1950. 3 figs., 17 refs.

Two groups of rats were irradiated with *x* rays in doses ranging between 600 and 1,400 r, one group in an atmosphere of 20% oxygen and 80% nitrogen (normal) and the other in 5% oxygen and 95% nitrogen (anoxic). The period of exposure was about 8 minutes and this was shown to be non-lethal in itself. The LD 50 was just over 600 r for the normal group and between 1,200 and 1,400 r for the anoxic group. The anoxic rats that died showed the same clinical picture as the control rats, but the survivors did not react so severely to irradiation and recovered more rapidly. Mice were similarly protected against 500 r by a limited degree of anoxia. Histotoxic anoxia produced by the injection of sodium cyanide gave no protection.

The authors conclude that radiochemical reactions involving free oxygen play an important part in the pathogenesis of radiation injuries. *Christine Pearce*

2294. **Effect of Early Cross Transfusion on *X*-irradiation Disease**
P. F. SALISBURY, P. E. REKERS, J. H. MILLER, and N. F. MARTI. *Science* [*Science*] **113**, 6–7, Jan. 5, 1951. 2 figs., 8 refs.

RADIOTHERAPY

2295. **Roentgen Therapy Supplementing Surgery in the Treatment of Gliomas**
G. M. TICE and N. W. IRVING. *Journal of Neurosurgery* [*J. Neurosurg.*] **7**, 509–520, Nov., 1950. 26 refs.

A total of 52 patients with brain tumour were treated with *x* rays at the University of Kansas Medical Centre in the years 1923–48. " Of this number 15 are living and 37 are dead. The astroblastoma group shows an average survival rate of 46·4 months with 30% alive for 5 years. The cellular meningioma and haemangioblastoma group is too small to justify conclusion; 1 out of 5 is alive for 5 years. The glioblastoma, spongioblastoma, and oligodendroglioma show no 5-year cures; there is an average survival of 16 months. The medulloblastoma series (16 cases) shows a 21·3 months average survival, and no patient living for 5 years. "

A review of relevant literature is given to indicate that irradiation of the brain of animals and of man

may produce degenerative changes in normal brain tissue. Wachowski and Chenault (*Radiology*, 1945, **45**, 227), after giving doses of 7,750 to 8,910 r, found " widespread pathological changes, affecting all cellular elements, degeneration of nerve cells, and excessive accumulation of fat. While degenerative changes were seen around smaller blood vessels, larger vessels were undamaged ". In none of their cases was tumour tissue entirely destroyed.

Since glioma apparently cannot be cured with radiation, the objective must be to give such a dose that the tumour will show maximum regression with the least amount of damage to normal brain tissue. The authors gave the average brain tumour in the adult a dose of 5,000 r in one series, or, if indicated, 6,000 r in 2 series spaced 2 months apart. To children 4,000 r is given. The dose is given in 25 to 30 treatments. Usually four portals are used, one portal daily being utilized. The size of the portal is either 8×8 cm. or 10×10 cm. A further review of articles by other authors shows that 5,000 r to 6,000 r is the generally accepted tumour dose, protracted over 20 to 30 treatments.

D. W. C. Northfield

2296. **Treatment of Antral Cancer by Combined Surgery and Radium Therapy**

V. P. Collins and J. L. Pool. *Radiology* [*Radiology*] **55**, 41–45, July, 1950. 5 figs., 8 refs.

Although survival for as long as 5 years has been procured in carcinoma of the antrum by operation or radiotherapy alone, difficulties are encountered in each method. Often the disease is found to be too widespread at operation for radical surgery, or, when radiotherapy is used, its full extent cannot be ascertained by physical examination. For these reasons the authors advocate a combined attack.

Preliminary operation is employed. Limited antrostomy is performed for lesions of the floor of the antrum or for palliation; or a more radical removal of all but the posterior wall of the antrum can be undertaken. An elaborate pre-operative routine is followed, and post-operatively nasal feeding is preferred. Radiotherapy is begun by means of a radium mould 10 to 14 days after operation. A 50-mg. radium tube is used and is considered as a point source. The dose is calculated in roentgens at the surface of a sphere up to 6·0 cm. in diameter. The radium tube is so arranged that the highest dose is absorbed in the applicator and a therapeutic dose given to the tumour, while normal tissues are spared as far as possible. The dosage given is of the order of 8,000 r, in 5 to 7 days at the surface of a 5-cm. sphere. A chart is given from which the dose can be readily calculated for various therapeutic conditions. The position of the radium is checked by preliminary *x*-ray examination.

[The close co-operation between surgeon and radiotherapist is gratifying and the combined effects of surgery and radiotherapy in this disease offer a greater chance of success. The dosage advocated seems rather excessive in an area where necrosis of bone can so readily occur.] *R. D. S. Rhys-Lewis*

2297. **Treatment of Carcinoma of the Nasopharynx by Irradiation**

T. P. Eberhard and R. H. Leaming. *Radiology* [*Radiology*] **55**, 46–51, July, 1950. 4 figs., 7 refs.

The authors draw attention to the presenting symptoms in nasopharyngeal carcinoma—enlarged cervical lymph nodes or cranial-nerve involvement rather than nasal obstruction or epistaxis. They advise a full clinical and radiological examination of the upper air passages and the base of the skull in these cases. Only in this way can the full extent of the tumour, often with unsuspected extensions, be assessed. They state that 40% of malignant nasopharyngeal lesions are squamous carcinomata, 40% lymphosarcomata, 10% " lympho-epitheliomata ", and the remaining 10% an assortment of rarer tumours. For this reason biopsy study of the primary is essential as a guide to treatment and prognosis, though prognosis very largely depends on whether or not bone is involved. They do not consider lymph-node metastases so serious a handicap.

The technique of treatment is to deliver 4,000 to 4,500 r to the lesion in 4 weeks, though this is not possible where involvement is extensive and large fields have to be used. Where adequate radiation cannot be delivered to the tumour by external *x*-rays, radium can be inserted locally into the nasopharynx, either mounted in a tube in a hollow " cork " or in a special metal applicator.

The authors quote some of the recent results of others, ranging from 9 to 27% 5-year survival rates. One of them quotes a 25% 10-year survival rate in a series of 20 cases treated between 1936 and 1939, but far less impressive results in a smaller series treated by the same technique at another clinic. He attributes this difference to the fact that cases were treated earlier in the first series.

[The authors do not state whether the technique used varies according to the histology of the tumour. In Britain it is thought advisable to treat lymphosarcoma, the reticuloses, and lympho-epithelioma with wide fields, and to reserve smaller fields and radium for the more localized carcinomata.]

R. D. S. Rhys-Lewis

2298. **Supervoltage Roentgen Therapy in Cancer of the Mouth and Throat**

M. D. Schulz. *Radiology* [*Radiology*] **55**, 52–59, July, 1950. 6 figs., 9 refs.

In this paper, the author outlines the value of supervoltage (1,000 to 3,000 kV) *x*-ray therapy in the treatment of malignant disease of the mouth and throat. It is pointed out that neoplasms in this region are seldom at any great depth below the skin surface as compared with the more deep-seated tumours in other parts of the body. Any advantages which may accrue are due, therefore, not so much to the attainment of a better depth dose as compared with 200-kV radiation as to the greater nicety with which a dose can be readily built up in the tumour with the use of beams of small dimensions. In addition to the higher depth dose attained with small fields in supervoltage therapy, there is the

added advantage that differential absorption by the various tissues (such as bone) is decreased with increase in voltage. It is emphasized that no biological superiority is attributable to the shorter wavelength. Supervoltage therapy is evaluated from two aspects: (1) its effect in ridding a patient of a malignant neoplasm, and (2) the amount of damage done to normal tissues in attaining this end.

The results of treatment with supervoltage and 200-kV *x*-ray irradiation at the Massachusetts General Hospital and the Huntington Memorial Hospital, Boston, of a series of patients with carcinoma of the tongue and of the tonsil is compared. In both instances the tumour dose given was 5,000 r or more. Only inoperable cases of carcinoma of the tongue were given radiotherapy, and 146 cases are reported in tabular form. Of these, 42 were treated with supervoltage and 98 with 220-kV radiation. Of the former 33 (88%) and of the latter 81 (82%) had died of cancer within 5 years of the onset of the disease.

These figures are compared with those obtained at other clinics. Of 20 patients with carcinoma of the tonsil treated with supervoltage radiation 9 (32%) had survived 3 years after treatment, but only 5 (18%) of the same number treated with 200-kV *x* rays; 5 (24%) out of 21 who received supervoltage and only 1 (6%) out of 18 who received 200-kV radiation survived 5 years or more. It is pointed out that this apparent superiority of supervoltage over 200-kV radiation is more apparent than real, as the early cases treated with 200-kV *x* rays received a tumour dose only of the order of 3,000 r. The cases treated with supervoltage *x* rays were given a tumour dose of the order of 5,000 r. More recently it has been possible to give a similar dose with 200-kV radiation, and the difference in the survival rates with the two techniques has not been so great.

The main advantage of supervoltage, the author states, is that an adequate dose can be given to relatively small tumour volumes without damage to the skin. Comparative figures are given for skin erythema dose at various voltages. No over-all times are given for the dosage used.

[It is now known that with ascending voltage the maximum absorption occurs at a deeper level. The long-term ill effects of supervoltage therapy are therefore likely to be in the subcutaneous tissues rather than the skin. The incidence of necrosis of the jaw should be decreased with supervoltage, but clearly this is only likely to be avoided in cases where the teeth have been extracted before irradiation and where the bone is not already exposed and infected.]

R. D. S. Rhys-Lewis

2299. **Treatment of Cervical Lymph Node Metastases with Irradiation Alone**

C. L. MARTIN. *Radiology* [*Radiology*] **55**, 62–67, July, 1950. 2 figs., 14 refs.

The results of treatment of cervical lymph-node metastases with irradiation alone are compared with those of operation. The widely held opinion that surgery holds the only hope of cure for lymph-node metastases in the neck is challenged, and the figures of Brown and McDowell showing a 25% 5-year cure rate in 410 operable cases are quoted. The author states that 15% is more likely as an absolute figure for all cases, though this is difficult to obtain.

The radiological technique of various authorities is then mentioned, such as external *x*-ray therapy combined with interstitial radon seeds, *x*-ray therapy alone to a very high dose after the reflection of skin flaps, the use of low-intensity interstitial radium needles, and external teleradium. The author's own technique consists in performing a plane implant of the lymphatic bed with low-intensity radium needles to give a dose of 6,000 to 12,000 r in 7 days. On the day following the implant a course of *x*-ray therapy is begun, and 2,100 r is given with a field up to 10×15 cm. in area in six fractionated doses. The skin reaction appears 10 days after the completion of treatment and a moist desquamation healing in 6 to 8 weeks occurs. Radiotherapy following block dissection and coincidental radiotherapy of the primary and the neck have both been abandoned because of late necrosis. It is recommended that the treatment should only be given when lymph nodes are palpable and the primary has healed.

Following a spectacular success in the first case treated in this way in 1935, this method was generally adopted in 1937. Of the 146 patients treated between 1937 and 1944, 40 (27·3%) remained well for from 5 to 11 years after treatment. The lymph nodes regressed completely in 102 (70%) of these patients. No block dissections were carried out in these cases.

The author then deals with possible objections raised by the sceptical. In 17 cases either a surgical or needle biopsy of the lymph nodes was performed, and a histological report of squamous carcinoma was obtained: 9 of these were well 5 years or more. It is agreed that the prognosis is better when the nodes are small, but good results are also obtained with large nodes.

Finally, the cause of death in 91 of the 146 cases quoted is analysed and it is shown that about half died of cancer of the head and neck, 3 of primary cancer elsewhere, 19 of distant metastases, and 12 of intercurrent disease. Attention is drawn to the possibility of mediastinal extension even after eradication of the disease in the head and neck.

[This paper reopens a question which has been largely regarded as settled, at least for the present. In Britain it is generally held that radiotherapy is the treatment of choice for the primary tumour, and that operation should be the mainstay of treatment of the neck lymph nodes. If no lymph nodes are palpable, the patient is kept under observation, and surgery only instituted when they appear. If they are already palpable, then operation is performed, provided they are strictly operable. A full block dissection should be carried out, and no half-hearted surgery is worth contemplating. The author does not state at what treating distance he gives such a high dose as 6,000 to 12,000 r from the interstitial radium implant, nor how many planes are used in treating the larger lymph-node masses. Moreover the area of the implant is not specified.]

R. D. S. Rhys-Lewis

2300. **Transvaginal *X*-ray Treatment of Cervical Cancer**
A. W. ERSKINE. *Journal of the Faculty of Radiologists* [*J. Fac. Radiol.*] **2**, 124–133, Oct., 1950. 7 figs., 21 refs.

The author briefly discusses the advantages of endovaginal *x*-ray treatment over radium therapy in the management of primary cervical carcinoma. Its superiority is attributed to the better distribution of radiation " which cannot be accomplished by any other known method ". The percentage depth dose at 3 cm. is 70 at 200 kV (60% at 135 kV), while with conventional radium techniques not more than 30% of the surface dose reaches a depth of 3 cm.

The author uses a specially constructed, expanding, four-blade speculum which is inserted into the vagina, expanded, and then attached to the tube head of the *x*-ray plant. When completely expanded the speculum exposes a rectangular field 4·8 by 5·7 cm.; an inflated airbag is used as obturator, and 1,000 r (in air) is given once a week for 5 weeks, although this may not represent the optimum dose. [No final conclusions about the optimum dose have yet been reached.] It is admitted that expansion of the blades of the speculum always causes discomfort and, sometimes, enough pain to necessitate intravenous anaesthesia. As in all single-field techniques, the dose at the periphery is considerably less than that at the centre. This might be overcome by the use of multiple overlapping fields. Vaginal atresia is considered the only definite contraindication to the transvaginal method.

Of a total of 221 cases, 125 treated before 1945 have been analysed statistically as follows: By Schmitz's classification 25 of the 125 cases belonged to Group (1), 34 to Group (2), 54 to Group (3), and 12 to Group (4). A total of 61 patients survived 5 years: Group (1) 23; Group (2) 22; Group (3) 14; and Group (4) 2. The author admits that some of the cases may have been improperly classified. He points out that " Stage I in the League of Nations Classification corresponds fairly exactly with Groups (1) and (2) according to Schmitz ".

Complications after treatment included cystitis (15 cases), proctitis (12 cases), and intestinal obstruction, probably due to exposure of a loop of small bowel (5 cases). The most frequent complication was vaginal atresia, which occurred in 48 of the total of 221 cases treated to date. *Jan G. de Winter*

2301. **Unusual Glomerulonephritis in Young Children, probably Radiation Nephritis. Report of Three Cases**
W. W. ZUELZER, H. D. PALMER, and W. A. NEWTON. *American Journal of Pathology* [*Amer. J. Path.*] **26**, 1019–1039, Nov., 1950. 25 figs., 11 refs.

Renal damage from *x* rays is well known in experimental animals but unknown in human beings receiving ordinary therapeutic doses. The authors report 3 cases in children, 2 of whom had been operated on for renal embryoma and one for retroperitoneal neuroblastoma. In the first 2 cases the kidney tissue adjacent to the tumour was normal; in the third case tests for kidney function were initially normal. Death from renal failure with hypertension occurred in from 5 to 7 months from the start of, and 4½ to 9 months from the end of, radiation therapy. The brunt of the damage was borne by the endothelium and basement membrane of the glomeruli. Lesions in the arteries and tubules appeared secondary to this. Nephrons were irregularly affected and in different degrees. *D. M. Pryce*

2302. **Malignant Renal Tumours. Results of Treatment 1920–1943.** (Die bösartigen Nierengeschwülste. Behandlungsergebnisse aus den Jahren 1920–1943)
F. BERNER. *Strahlentherapie* [*Strahlentherapie*] **83**, 199–230, 1950. 13 figs., 26 refs.

The pathological, clinical, and radiological features of malignant renal tumours are first reviewed. A distinction is drawn between the Grawitz hypernephroma and true carcinoma, though the criteria are admitted to be uncertain. For the early case radical operation is the best treatment; if this is contraindicated by other conditions, or if the tumour is large, fixed, or infiltrating or has metastasized, primary irradiation is best. Though theoretically an inoperable tumour might be made operable by irradiation, this is rarely, if ever, possible in practice. The Wilms embryoma is radiosensitive, but if extracapsular spread has occurred, irradiation cannot make it operable. Radiotherapy is valuable for metastases in bone, causing recalcification and decreasing pain, with postponement of the need for morphine for a long time. In presence of secondary tumours, the primary tumour need be irradiated only if there are pressure symptoms, pain, or bleeding. Routine post-operative *x*-irradiation is advised; it is especially important after incomplete operation, and should be begun on the day of removal of sutures. Radiosensitivity is, in general, only moderate, and at least two series of treatments should therefore be given.

There were 81 cases of hypernephroma; 8 patients survived 5 years or more; of these 4 had radical operation and irradiation and 4 had *x*-irradiation either alone or many years after operation. One patient had a bone metastasis in the pelvis and, after radiation treatment of primary and secondary, is alive at 10 years; another, treated for local recurrence, survived 8 years. Treatment of metastases, therefore, especially if solitary, is well worth while; of 18 patients in whom metastases alone were treated, 2 survived 4 years. Bone metastasis was found to be invariably accompanied by secondaries in the lungs, even if only microscopic; these can be latent for long periods. Of 16 patients with proved carcinoma, 2 survived 5 years. In 3 cases of sarcoma, and 7 of embryoma in children, there were no late survivors.

Deep *x*-ray technique involved use of 3 fields (anterior, posterior, and lateral) or preferably 5 (additional anterior and posterior fields from the opposite side to cover the lymphatics which connect with those of the other side). Field size was mostly 15×10 cm., or 20×24 cm. for large tumours, decreasing if possible as the growth shrank. Two fields were treated daily at first, later one field; dosage began at 275 r, gradually decreasing; total time was 6 weeks or more. For post-operative cases, 6 field-cycles usually sufficed.

J. Walter

RADIODIAGNOSIS

2303. **Cerebral Angiography**
J. B. CURTIS. *British Journal of Surgery* [*Brit. J. Surg.*] **38**, 295–331, Jan., 1951. 57 figs., bibliography.

2304. **Developments in Cerebral Angiography with Rapid Serialized X-ray Exposures on Roll Film 9½ Inches Wide**
W. G. SCOTT and W. B. SEAMAN. *Radiology* [*Radiology*] **56**, 15—30, Jan., 1951. 12 figs., 16 refs.

2305. **Angiography of the Thoracic Aorta by Direct Puncture.** (Angiographie de l'aorte thoracique par ponction directe)
J. MENESES HOYOS and C. GOMEZ DEL CAMPO. *Archives des Maladies du Cœur et des Vaisseaux* [*Arch. Mal. Cœur*] **43**, 996–1001, Nov., 1950. 1 fig., 15 refs.

A method is described which gives very clear angiographic pictures of aortic arch and descending aorta, valuable in the differential diagnosis between tumour and aneurysm of the descending aorta, and in the precise localization of coarctation of the aorta and similar conditions. The contrast medium is injected direct into the aorta through a puncture in the second left interspace near the sternal border, under general anaesthesia. Out of 8 cases this method caused a small pleural haematoma twice, and the grossly enlarged left mammary artery was entered once in a case of aortic coarctation without untoward consequence. Aneurysm of the ascending aorta or of the arch is the only contraindication.

G. Schoenewald

2306. **Retrograde Thoracic Aortography by Injection into the External Carotid Artery. Application to Coronary Arteriography.** (Aortographie thoracique rétrograde intra-carotidienne. (Application a l'artériographie des coronaires))
—. PIERRE-MARION and J. PAPILLON. *Presse Médicale* [*Pr. méd.*] **58**, 1474–1477, Dec. 25, 1950. 11 figs.

Several methods have hitherto been used to outline the aortic arch by opaque media, and there is no doubt that the orthodox angiocardiographic method is not really satisfactory for this purpose. Retrograde catheterization has been carried out through the radial artery, brachial artery, and common carotid artery; the present authors have performed it through the external carotid artery. The illustrations to this paper provide convincing evidence that this method of examination is very satisfactory. The advantages are: (1) No obstruction of the carotid flow while the catheter is being introduced. (2) The catheter can, with moderate ease, be introduced into the ascending aorta, where the most satisfactory concentration of opaque medium can be achieved. (3) Only a small incision is required to expose the external carotid artery.

This method is indicated in cases in which the aortic arch or its branches, including the patent ductus, need to be adequately demonstrated. The authors claim that it is reasonably satisfactory in demonstrating the coronary arteries but, while this has been satisfactorily achieved in dogs, adequate visualization in human subjects has not yet been obtained.

[There is no doubt that the authors have elaborated a very satisfactory technique for examination of the thoracic aorta, which would appear to be fully as advantageous as any other method so far devised.]

R. A. Kemp Harper

2307. **Angiopneumography in Silicosis and Bronchiectasis.** (L'Angiopneumographie dans les silicoses et les dilatations bronchiques)
A. G. WEISS, J. WITZ, and F. KOEBELE. *Presse Médicale* [*Pr. méd.*] **58**, 1437–1438, Dec. 25, 1950. 9 figs., 16 refs.

By means of angiocardiography the rate of circulation and the distribution of pulmonary vessels have been studied in patients suffering from silicosis and bronchiectasis. In such patients there is considerable alteration in the distribution and calibre of the pulmonary branches and, in addition to considerable distortion of the pulmonary arteries, delay in the circulation of the opaque medium occurs.

[There are relatively few illustrations to demonstrate the points emphasized by the authors, and it would be necessary to see a fairly large series of such examinations before the full effects of the changes could be appreciated.]

R. A. Kemp Harper

2308. **A Roentgen Study of Skeletal and Intrathoracic Metastases from Salivary Gland Cancer**
D. WILNER. *Radiology* [*Radiology*] **55**, 801–806, Dec., 1950. 12 figs., 12 refs.

The author reviewed the *x*-ray appearance of the chest and skeleton in a series of 49 cases of microscopically proved salivary-gland cancer. There were 32 cases of parotid tumour, 16 submaxillary, and 1 sublingual. In 33 cases there was evidence of skeletal metastases, 21 being solitary foci and 12 multiple. Lesions in the mandible greatly predominated. There were roughly three types of lesion, a patchy or " moth-eaten ", ill-defined area of bone destruction; a purely lytic focus or hole in the bone having either well or poorly defined margins; and an erosive type. The last was a marginal defect of scalloped form and occurred almost exclusively in the mandible.

In the chest, evidence of metastases was found in 28 cases, there being intrapulmonary lesions in 23. There was one case of enlarged mediastinal lymph nodes; in the others, pleural effusions were present. The lung lesions were either " nodular ", mainly rounded, discrete foci variable in size (18 cases) or " miliary ", with small punctate shadows scattered throughout the lung zones (5 cases).

A. M. Rackow

2309. **Portal Venography**
G. E. MOORE and R. B. BRIDENBAUGH. *Surgery* [*Surgery*] **28**, 827–831, Nov., 1950. 4 figs., 2 refs.

The authors record the technical details of their method of viewing the portal vein and the portal radicals within the liver. A " polythene " catheter is inserted into one of the tributaries of the portal vein, such as the right gastro-epiploic vein. The catheter is then advanced

until its tip reaches the portal vein, the catheter is tied in place, and 20 ml. of 35% diodone is injected as rapidly as possible over a period of 2 or 3 seconds; immediately upon completion of the injection a radiographic exposure is made by means of a mobile 50-ma *x*-ray machine and a hand-operated Potter–Bucky diaphragm. Clear pictures of the outlined portal system within the liver are given. There were no serious reactions or complications, though in one instance the systolic blood pressure fell by 30 mm. of mercury for a short time. On two occasions there was extravasation of the contrast medium, but no sequelae of any importance. Most of the unsatisfactory examinations were due either to failure to pass the tip of the catheter into the portal vein or to failure to inject the contrast medium with sufficient rapidity. *Ian Aird*

2310. **The Early Diagnosis of Carcinoma of the Cardia of the Stomach**
M. DANNENBERG and I. K. ETTMAN. *Review of Gastroenterology* [*Rev. Gastroent.*] **17**, 1123–1129, Dec., 1950. 9 figs., 9 refs.

Many carcinomata of the upper pole of the stomach are missed radiologically. In 1,000 cases referred to the *x*-ray department of Beth-El Hospital, Brooklyn, for examination of the gastro-intestinal tract the authors found 25 cases of carcinoma of the cardia, 18 in men and 7 in women. The typical symptoms are given. [No mention is made of the difficulty which many of these patients have in silent belching and in maintaining a normal gastric air bubble.] Mucosal studies of the fundal region rarely helps, because the folds are normally coarse and irregular. Examination in the Trendelenburg position is useless. Distension of the stomach with a Ryle tube is dangerous, for it may start a haemorrhage. The most valuable method is to coat the mucosa with a thin barium suspension and then to give a fresh mixture of Seidlitz powder in water so as to distend the upper pole with gas. In the differential diagnosis enlargement of the heart, liver, spleen, accessory spleen, and retroperitoneal masses must be excluded. In a few cases difficulty sometimes arises from protrusion of the oesophageal mucosa through the cardia.

Denys Jennings

2311. **Nephrography: Simplified Technic**
J. VESEY, C. T. DOTTER, and I. STEINBERG. *Radiology* [*Radiology*] **55**, 827–833, Dec., 1950. 5 figs., 9 refs.

The authors have demonstrated that useful opacification of the renal substance can be obtained between a quarter and half a minute after injecting 50 ml. of diodone or "iodoxyl" intravenously. The injection is made through a wide-bore needle and should be completed within two seconds. The first film is taken at 16 seconds and another as soon as the cassette can be changed. The examination may then continue as in ordinary pyelography. Good nephrograms were obtained in 18 out of 25 cases. The failures the authors attribute to wrong timing and suggest that serial changers would obviate this.

Good illustrations of 5 cases are given. The method is regarded by the authors as having no more danger than an ordinary intravenous pyelogram except that the greater amount of opaque substance might increase the risk of local vein thrombosis. *A. M. Rackow*

2312. **Pelvic Phlebography in the Male.** (Röntgendarstellung der Gefässe des Beckens beim Männe)
A. DE LA PEÑA. *Zeitschrift für Urologie* [*Z. Urol.*] **43**, 474–475, 1950. 2 figs.

Injection of radio-opaque fluid into the dorsal vein of the penis may be used to indicate the presence of vascular anomalies and thromboses. It is suggested that the technique may assist in the early diagnosis of hepatic disease, and can be utilized to assess local complications following prostatectomy. *J. D. Fergusson*

2313. **Roentgenological Visualization of Genital Tract in Pseudohermaphrodism**
R. J. MCCAFFERY. *Journal of Urology* [*J. Urol.*] **64**, 791–798, Dec., 1950. 4 figs., 5 refs.

Pseudo-hermaphrodism (intersexuality) can be produced by aberrations of either genetical or hormonal influences. The potency of the recessive gonad may be above normal, and the hormonal influences are maternal sex hormones. When a feminizing gene exists the male embryos develop female sex characteristics, or hormone-producing tumours, with hyperplasia of the adrenal cortex. In intersexuality, absolute determination of the sex is often impossible, but as an adjunct to diagnosis *x*-ray visualization of the genital tract may be of great help. The technique adopted is an adaptation of utero-tubography. For example, an absent vagina may be simulated by a hypospadic male urethra, or the vagina may be invisible at the orifice but join the urethra a short distance proximal to the external meatus. The medium used may be iodized oil or silver proteinate. The theoretical dangers are infection, intravasation of uterine or ovarian veins, the commonest but apparently harmless tubal rupture, and abortion. The contraindications are infection in any part of the tract, fever from any cause, vaginal bleeding, and pulmonary or cardiac diseases. In the most common type of intersexuality there are fully or partially sterile testes, male gonaducts, a blind vagina, female-type external genitalia, fairly well developed breasts, no beard, and a high-pitched voice.

Four cases are described where this method was utilized. *S. M. Vassallo*

2314. **The Employment of Water-soluble Iodine Products in Bronchography.** (Utilisation des produits iodés hydrosolubles pour la bronchographie)
P. DELIE and P. SOURDAT. *Presse Médicale* [*Pr. méd.*] **58**, 1156–1158, Oct. 18, 1950. 10 figs., 10 refs.

2315. **Limitations of Roentgen Rays in Diagnosis of Bladder Stone**
F. H. SQUIRE and H. L. KRETSCHMER. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 81–82, Jan. 13, 1951. 1 ref.

Pathology

2316. **The Nature of Neurofibromatosis and Related Lesions, with Special Reference to Certain Lesions of Bones: Illustrating the Influence of Intrinsic Factors in Disease when Development of the Body is Abnormal**
K. INGLIS. *Journal of Pathology and Bacteriology* [*J. Path. Bact.*] **62**, 519–530, Oct., 1950. 8 figs., 28 refs.

A fatal case is described of neurofibromatosis associated with a malignant tumour, spinal curvature, telangiectasia, *café au lait* patches, and terminal epilepsy. There was a strong family history of related lesions, the patient's father having a "sarcoma" of the sciatic nerve, his sister having cutaneous neurofibromatosis, and his brother a hydrocephalus. Necropsy was performed and the lesions present were examined histologically. This case is discussed in conjunction with hydrocephalus, mental disease, epilepsy, malignant transformation, cutaneous pigmentation, haemangiomatosis, and certain lesions of bones, such as spinal curvature, congenital pseudarthrosis tibiae, congenital absence of bones, and congenital small size of bones.

As regards heredity, the author suggests that it is a predisposition to neurofibromatosis that is inherited rather than the disease itself, and that it is this predisposition which influences the development of a great variety of lesions at what the author terms "the basic intrinsic factor level"—that is, at the time of fertilization of the ovum. At later stages of development, which are described as the "neural" and "neurofibromatosis intrinsic factor" levels respectively, the variety of lesions produced becomes progressively less.

Lesions representative of all three levels may be present in one and the same individual, together with other lesions which may be of a purely secondary nature. It is thought that the bony lesions in the present case are linked up with neurofibromatosis on the basic intrinsic factor level. Other lesions which the author suggests may be related to this complex include neurilemmoma, meningioma, fibroma, lipoma, glioma and glial hyperplasia, and spina bifida, as well as those already mentioned. *R. B. T. Baldwin*

EXPERIMENTAL PATHOLOGY

2317 (*a*). **Freezing and Desiccation of Mouse Tumours**
R. D. PASSEY and L. DMOCHOWSKI. *British Medical Journal* [*Brit. med. J.*] **2**, 1129–1134, Nov. 18, 1950. 20 figs., 44 refs.

The authors have examined the claims of Gye and his associates that the transplantibility of freeze-dried mouse sarcoma indicates that the tumour is transmitted by a virus, since freeze-drying is supposed to kill the cells. They found no difficulty in confirming Gye's results with mouse sarcoma, but found that mouse carcinoma was more difficult to transmit by the transplantation of freeze-dried material than is sarcoma. They point out, however, that "it is not altogether surprising that the sarcomata should withstand the treatments of freezing and of freeze-drying better than the carcinomata. The carcinomata as a whole are derived from more highly differentiated tissues than the sarcomata, and it would not be unreasonable to expect them to be more susceptible to adverse conditions. Certainly in our experiments there were more visible changes, suggesting cell damage, to be found microscopically in the case of the carcinomata than in the sarcomata; it may not be unreasonable to associate this fact with the experimental results." Moreover, on centrifugation of reconstituted freeze-dried tumour material the agent was always found in the sediment and never in the supernatant, which they regard as convincing evidence that no virus is concerned in the transmission of the tumour Although it was confirmed that microscopical examination of the freeze-dried material "showed only a mass of debris and shrunken nuclei", after the addition of diluent "many of the tumour cells [were], to all appearances, intact, resembling in their entirety the tumour cells before the treatment". The authors quote a number of investigations showing that a considerable variety of normal and tumour tissues will withstand freezing and that some will survive freeze-drying.

[Other investigations the results of which also conflict with the assumptions of Gye and his colleagues and are in entire agreement with the results obtained by the present authors have been reported by Hieger and Waymouth (*Rep. Brit. Emp. Cancer Campaign*, 1949, 48), Hamer (*ibid.*, 189), and Scarff *et al.* (*ibid.*, 73).]
I. Hieger

2317 (*b*). **Cultivation *in vitro* of Frozen and Desiccated Mouse Tumour Tissues**
R. D. PASSEY, L. DMOCHOWSKI, I. LASNITZKI, and A. MILLARD. *British Medical Journal* [*Brit. med. J.*] **2**, 1134–1136, Nov. 18, 1950. 14 figs., 5 refs.

As already reported (see Abstract 2317 (*a*)), the authors have confirmed the finding that tissue from a sarcoma grown in C_3H mice can be successfully transplanted after freezing and drying by the technique of Gye *et al.* (*Brit. J. Cancer*, 1949, **3**, 259). They have, however, also demonstrated that some of these freeze-dried preparations, after reconstitution in glucose solution, may show active growth *in vitro*, indicating that some of the cells are still alive and therefore that the theoretical mediation of a virus is superfluous. They state that "in our hands suspensions of tumour cells desiccated for longer periods than 75 minutes failed to grow in tissue culture, but induced tumours in mice. This is probably due to the more favourable conditions *in vivo*, which offer better chances of recovery for the treated tumour cells than does the environment *in vitro*; it suggests that successful growth in tissue culture depends on the length of time of desiccation. Although the degree of desiccation reached after 75 minutes may be high, it is

realized that dehydration is not complete. If the time of desiccation is more prolonged only few, if any, cells can be expected to survive." *I. Hieger*

2318. **The Ameboid Motility of Human and Animal Neoplastic Cells**
H. T. ENTERLINE and D. R. COMAN. *Cancer* [*Cancer*] **3**, 1033–1038, Nov., 1950. 4 figs., 26 refs.

Human tumour tissues were placed in Carrel flasks embedded in clots composed of fowl plasma and chick-embryo juice, with 50% human foetal serum in physiological salt solution as the nutritive medium. The movements of cells were recorded by cinephotomicrography. Cells were studied in tissue from 6 cases of breast carcinoma, one of renal carcinoma, one of a mesenteric leiomyosarcoma, and one of benign tumour of the parotid gland (oncocytoma); tissue from mouse fibrosarcoma 241, Walker rat carcinoma 256, and V2 rabbit carcinoma was also studied. The malignant cells in all these tumours were actively amoeboid. The same property was exhibited *in vitro* by non-malignant glandular epithelial cells from a case of cystic disease of the human breast after they had become detached from their neighbouring cells.

The average rate of movement of human carcinoma cells varied, in the several experiments, between 0·3 μ and 1·4 μ per minute, and the maximum rates between 0·9 μ and 4·4 μ per minute. Small clusters of from three to five malignant cells were found at times to move *en masse*.

The authors conclude that these results lend strong support to their theory that " at least one of the factors in the invasiveness of cancer is the amoeboid movement of cells that have become detached because of their loss in mutual adhesiveness ". *R. J. Ludford*

2319. **Further Observations on the Effect of Anterior Pituitary Extract in Alloxan Diabetes**
R. F. OGILVIE. *Journal of Pathology and Bacteriology* [*J. Path. Bact.*] **62**, 639–646, Oct., 1950. 7 figs., 12 refs.

Two adult male rabbits from the same litter were given two injections of 100 mg. alloxan on the 16th and 25th days. There was a rise in the blood sugar level until about the 33rd day, accompanied by a glycosuria and polyuria but no ketonuria; there was little effect on body weight or on food consumption. The second injection of alloxan had little or no effect in enhancing the diabetic state produced by the first injection.

One rabbit was kept as a control, but the other was given two courses of anterior pituitary extract. The first course (31st to 40th day) of 0·5 g. per kg. body weight daily caused glycosuria, ketonuria, and polyuria, with loss of weight. The second course (44th to 61st day), 0·5, 1·0, and 1·5 g. per kg. body weight for 8, 5, and 5 days respectively, resulted in glycosuria, polyuria, and increase in weight without ketonuria. The glycosuria was less than that observed during the first course and disappeared on the 54th day, that is, before the end of the course. The food consumed was reduced by 2% during the first course and increased by 5% in the second course, the net gain in weight being 10%.

Histological examination of 300 unselected samples from the pancreas showed that the number and size of the islets were reduced, also the number of α cells. Regeneration of islets was seen by enlargement, budding, and a suggestive growth of new islets from ducts. On an average the islets of the rabbit given anterior pituitary extract were larger than those of the control. Hydrops of the β cells was absent in both rabbits, this feature being regarded as an exhaustion effect of prolonged hyperglycaemia.

The diabetogenic effect of the anterior pituitary extract was evident immediately and was more lasting than that seen in the control rabbit, presumably because the availability of insulin was reduced by the adverse effect of the alloxan on the islands. The pancreatrophic effect of the extract required some time to become manifest, but ultimately the islets were larger than in the control animal. The resultant increase in the insulin secretion counteracted the diabetogenic effect of the second course of anterior pituitary extract to some extent, the glycosuria being much less. This, coupled with the normal growth effect of the extract, resulted in a gain in weight during the second course.
R. B. T. Baldwin

2320. **The Vascular Supply to the Liver and the Anatomy of Eclampsia**
A. D. T. GOVAN and C. L. MUKHERJEE. *British Journal of Experimental Pathology* [*Brit. J. exp. Path.*] **31**, 485–494, Aug., 1950. 8 figs., 34 refs.

The authors are not prepared to accept the view that the liver lesions in eclampsia are due to a toxin; they tend to ascribe them to hypertension and arteriolar spasm. They have therefore examined the liver lesions in 20 cases of eclampsia and tried to reproduce them in rabbits by injecting an emulsion of olive oil into the hepatic artery of one group of animals, into the portal vein of a second group, and into both artery and vein of a third group, a fourth group being kept as controls. When the injection was given into either the artery or the vein alone, mid-zonal and centrilobular necrosis usually resulted. If the artery and vein were injected simultaneously, periportal necrosis was produced. It is claimed that the lesions in their distribution, and to some extent in their detailed histology, resembled those of eclampsia. As the emulsion acts by producing intravascular emboli it is suggested that the hepatic lesions of eclampsia are also the result of vascular occlusion. *F. J. Browne*

2321. **Alterations in Renal Function, Including Hematuria, in Man during Intracranial Air Studies. Alterations in Cardiac Function**
S. J. WEINBERG, J. R. GOODMAN, and M. C. BUSHARD. *Archives of Internal Medicine* [*Arch. intern. Med.*] **86**, 857–871, Dec., 1950. 6 figs., 33 refs.

A control diuresis having been produced on the day before the air-study, ventriculography and pneumoencephalography in 10 male patients, after water diuresis had started, was found to cause oliguria and a reduction in urinary chloride and urea output. Glycosuria did not occur. The fall in volume was early and lasted for

from 1 to 10 hours. The fall in chloride and urea was generally not so great. The authors suggest that each constituent may have its own control mechanism. In most cases haematuria, with some leucocytes and epithelial cells, occurred during the period of oliguria; albuminuria occurred in only one case. The relation of these findings to the tubular degeneration produced in animals by posterior pituitary extracts is discussed. All the renal changes were less marked after ventriculography than after pneumoencephalography.

In 9 cases electrocardiographic (ECG) records (lead II) were taken during the procedure. Ventriculography produced no changes, while encephalography caused changes in the ECG in 3 of 6 cases: ventricular extrasystoles in one, depression of S–T segment in one, and in one case cardiac arrest for 12 seconds with syncope, followed by nodal escape; ventriculography in the same patient previously had caused no ECG changes.

As they had previously found that denervation does not prevent changes in renal function in experimental animals following central stimulation, the authors incline to the view that the changes are hormonal in origin. They discuss the interrelationships of posterior pituitary and adrenal cortex in the control of water and salt elimination after afferent stimuli. *J. Foley*

2322. **The Effect of Cortisone upon the Experimental Cardiovascular and Renal Lesions produced by Anaphylactic Hypersensitivity**
A. R. Rich, M. Berthrong, and I. L. Bennett. *Bulletin of the Johns Hopkins Hospital* [*Bull. Johns Hopk. Hosp.*] **87**, 549–567, Dec., 1950. 3 figs., 10 refs.

Having confirmed the fact that in sensitized animals treated with adrenocorticotrophin (ACTH) the incidence of cardiovascular lesions decreased, the authors describe a similar experiment. Rabbits were treated with cortisone and sensitized with intravenous horse serum. Among many interesting observations it was found that cortisone had little effect either on skin sensitization or on serum antibody levels. The incidence of cardiovascular lesions was much lower in the treated animals, the figures being practically identical with those obtained in a similar experiment with ACTH. The proliferative glomerular lesions seen in sensitized animals were completely absent, but a haemorrhagic lesion with focal glomerular necrosis was observed in many instances. It resembled the change seen in cases of diabetes mellitus and lupus erythematosus, but it is noteworthy that it was never observed in the animals treated with ACTH. The spleen contained foci of extramedullary blood formation, and the liver an excess of glycogen.
G. J. Cunningham

2323. **Local Cellular Responses in Experimental Hypersensitivity**
D. M. Angevine and C. V. Seastone. *American Journal of Pathology* [*Amer. J. Path.*] **26**, 1011–1018, Nov., 1950. 7 refs.

Sensitivity reactions were studied in guinea-pigs sensitized to egg albumen, and in rabbits sensitized to B.C.G. vaccine. Whereas Dienes and Mallory found that the monocyte was the predominant cell in delayed sensitivity reactions, and Follis did not obtain any special cellular response, the present authors found that in the early stages polymorphonuclear leucocytes were most numerous. They do not consider that there is any difference between cellular response to this type of reaction and that following other injuries. *D. M. Pryce*

2324. **New Methods of Staining for the Fluorescent Microscopy of Laboratory Material.** (Флуоресцентная микроскопия лабораторно-клиничского материала при новых методах его окраски)
N. N. Bobrov. Архив Патологии [*Arkh. Patol.*] **12**, No. 6, 45–47, 1950.

2325. **Histochemical Studies of Mouse Liver after Single Feeding of Carbon Tetrachloride**
R. E. Stowell and C. S. Lee. *Archives of Pathology* [*Arch. Path.*] **50**, 519–537, Nov., 1950. 4 figs., 49 refs.

MORBID ANATOMY

2326. **Pathologic Findings in Premature Infants**
J. B. Arey and J. Dent. *American Journal of Clinical Pathology* [*Amer. J. clin. Path.*] **20**, 1016–1025, Nov., 1950. 2 figs., 22 refs.

The authors emphasize the importance of prematurity in causing neonatal deaths, of which more than half occur in premature infants. They point out that one should not assume prematurity or atelectasis as such to be the primary cause of death unless all other possibilities have been excluded. Eighty-four premature infants were investigated. They weighed from 500 to 2,500 g. and had a duration of life ranging from 2 minutes to 25 days, 54 having lived less than 24 hours. The authors found that asphyxia was the cause of death in 20 cases, cerebral intraventricular haemorrhage in 11, congenital syphilis in 10, bronchopneumonia in 9, congenital anomalies in 4, and miscellaneous lesions in 19. Only in the remaining 11 cases could death be considered as due to no other cause than simple prematurity. [This study was undertaken at a hospital in New Orleans. Louisiana, U.S.A., and 71 of the infants were coloured, This may explain the high percentage of congenital syphilis, and it is also striking, in view of similar studies made in Europe, that only 2 of the 84 infants had died showing a tentorial tear.]

Of the 20 cases of asphyxia, 15 showed an intrapulmonary asphyxial membrane, with well-established aspiration of amniotic debris. In 5 there was only loose amniotic material in the respiratory tract. Microscopical examination is considered necessary because the macroscopical picture of an asphyxial membrane is indistinguishable from mere atelectasis, bronchopneumonia, and haemorrhage. Some interesting observations are made on the cases of bronchopneumonia, which disease is believed usually to start *in utero*. Whether it is always due to bacteria derived from infected amniotic fluid cannot be determined, and the possibility of simple irritation by amniotic material cannot be excluded.

Bacteriological examination was of no value in view of post-mortem invasion. No apparent correlation could be established between premature rupture of the amniotic membrane and bronchopneumonia in infants living less than 24 hours. Premature rupture had taken place in 3 out of 11 cases of bronchopneumonia and in 11 out of 20 cases without this disease. In bronchopneumonia, as in asphyxia, histological examination is essential to establish the diagnosis; the infection may be patchy, necessitating an extensive search in all areas of the lungs.

[The authors themselves raise a point which will occur to all readers of their paper who have ever themselves carried out a necropsy in a case of neonatal death. This is the difficulty of deciding which of several findings should be considered the primary cause of death and which factors should be considered merely contributory. Thus in an infant with a small tentorial tear, mild subdural haemorrhage, bronchopneumonia, and a history of premature rupture of the foetal membranes, should bronchopneumonia be considered the primary cause of death, or the intracranial damage? It is admitted that in many instances only an arbitrary decision can be made.] *H. Lehmann*

2327. **The Bone Marrow in Hutchison's Syndrome**
A. PINEY, J. MALLARMÉ, and M. S. ROSS. *Journal of Clinical Pathology* [*J. clin. Path.*] **3**, 230–238, Aug., 1950. 8 figs., 10 refs.

Left adrenal tumour and metastases in the calvarium in children constitute Hutchison's syndrome. This was observed in a girl of 7 years. She had also left-sided exophthalmos, moderate anaemia, and osteolytic lesions in the pelvis and femora. Sternal puncture yielded a cellular uniform marrow interpreted as "reticuloleucosarcomatosis". Two later sternal punctures showed 72 to 96% reticulum cells arranged in large sheets; some of these were phagocytic. In some of the syncytial masses fibril formation was seen. After 8 months' observation the child died. Necropsy revealed a left adrenal tumour, which histologically contained rosettes and was a neuroblastoma. The cells found in the marrow were re-examined, the authors regarding them as neuroblastoma cells. Some contained cell debris, but phagocytosis was not confirmed conclusively The recent literature on this subject, which is scanty, is reviewed. *E. Neumark*

2328. **Changes in the Substance of the Nucleoli of Bone Marrow Cells in Pernicious Anaemia and their Clinical Significance.** (Veränderungen der Nucleolarsubstanz an Knochenmarkzellen bei perniciöser Anämie und ihre pathogenetische Bedeutung)
U. HAENEL. *Helvetica Medica Acta* [*Helv. med. Acta*] **17**, 627–650, Dec., 1950. 20 figs., bibliography.

This is an attempt to explain the signs of pernicious anaemia as resulting from a single pathogenetic mechanism. The author used various cytochemical techniques on cells obtained by marrow puncture, paying special attention to the developmental changes in the nucleoli. Similar methods were applied to nerve cells. He concludes that the nucleolar changes in pernicious anaemia indicate a characteristic disturbance of protein synthesis. In the megaloblast the nucleolar changes which are present lead to loss of the power of heteroplastic division; they are associated with disturbance of differentiation. The same abnormality of protein synthesis affects granulopoiesis. Nerve cells with their basophilic nucleoli and basophilic Nissl substance are typically protein-synthesizing elements. He concludes that the nuclear changes in such elements are associated with abnormalities of intracellular protein metabolism of a type exactly similar to those occurring in the immature blood cells.

The changes in general are due to a disturbance of nucleic acid metabolism accompanied by defective formation of ribose nucleic acid in the nucleus, while at the same time there is a diminution of intracellular protein synthesis. It is especially the latter which explains the disturbance of haematopoietic and neural elements. *A. Piney*

2329. **An Anatomical Study of the Human Spinal Column: with Emphasis on Degenerative Changes in the Cervical Region**
D. E. MORTON. *Yale Journal of Biology and Medicine* [*Yale J. Biol. Med.*] **23**, 126–146, Nov., 1950. 7 figs., 24 refs.

The degenerative changes associated with the ageing process in the spinal column were studied in 40 unselected cadavers, 35 male and 5 female. The spinal columns were inspected after division by a mid-sagittal cut through the centra, but only the cervical regions were dissected and measured. The age at death ranged from 36 to 82 years and averaged 64·6 years.

Brown degeneration of one or more intervertebral disks was observed in 70% of the cadavers and fissuring in 30%, but neither change was consistently associated with other spinal changes. Posterior thinning of the disks was observed more frequently in the cervical and lumbar regions, while anterior thinning was more prominent in the thoracic region. Schmorl's nodules (54) were noted in 27 cadavers, with a higher incidence in the older specimens. The lumbar region had the smallest ratio of nodules to the number of disks. There was no constant correlation between them and other degenerative changes, and they did not appear to be prime factors in producing other forms of degeneration. A partial anterior herniation of the nucleus pulposus through the annulus fibrosus was noted once, but 14 posterior herniations were observed in 8 specimens. Eight of these (6 midline) indented the spinal cord and one aided in compressing a cervical nerve. Degenerative changes in the disks and vertebral bodies were not consistently associated with herniation. Posterior protrusion of one annulus fibrosus or more at least 2 mm. into the vertebral canal was observed in 77·5% of specimens, with posterior thinning of the disks a constant accompanying feature.

Changes in the vertebral bodies consisted of: (1) shortening but widening of the centra of C5 and C6; (2)

eburnation of the bodies at 21 disk levels in 9 cadavers, which was always accompanied by thinning of the corresponding disk; (3) antero-lateral or posterior hypertrophic lipping at the edges of the bodies in 90% and 80% of the specimens respectively. Lipping did not constantly accompany disk changes, approximately half the disks being normal. Posterior lipping caused indentation of the cord in 22·5% and was the predominant cause of a decrease in the antero-posterior diameter of the intervertebral foramina. Postero-lateral exostoses compressed spinal nerves in 20% of specimens, both these conditions being mainly in the cervical region. Hypertrophic or mixed arthritis of the articular processes was observed in 6 specimens; this was always accompanied by thinning of the disk at the corresponding level. *A. Ackroyd*

2330. **The Morbid Anatomy of Tuberculous Meningitis after Treatment with Streptomycin, with Particular Reference to Vascular Changes.** (Quadri morfologici della meningite tubercolare trattata con streptomicina con particolare riguardo alle alterazioni vasali)
P. BAGOLAN. *Ospedale Maggiore* [*Osped. maggiore*] **38**, 403–427, Aug., 1950. 6 figs., bibliography.

This survey is based on 42 necropsies performed at Milan on patients with tuberculous meningitis treated by streptomycin, though sometimes in small doses and only for short periods. The most important findings included only slight meningitis with little basal exudate, usually slight internal hydrocephalus, and obliterative endarteritis usually affecting vessels of medium and small calibre. Tubercles or tuberculomata were still present in 13 cases. In 15 patients who had received less than a total of 10 g. of streptomycin there was cerebral oedema, basal exudate, tubercles along the vessels in the Sylvian fissure and on the choroid, fibrinous leptomeningitis with fibroblasts, plasma cells, and polymorphs, as well as histiocytic proliferation of the intima of arteries. In those cases which had had 10 to 50 g. streptomycin, exudative and necrotic lesions were found in the meninges, and some tubercles showed amorphous, almost caseous, changes in the centre. The 10 cases which had received more than 50 g. showed rather more cerebral oedema and ventricular dilatation, slight fibrosis of the meninges, and diffuse fibroblastic and histiocytic change in the subarachnoid spaces. Giant cells were numerous. Endarteritis was most marked in this group in vessels of all sizes. *E. Neumark*

2331. **Rapid Diagnosis of Influenza at Necropsy by means of Cytological Preparations of the Tracheal Epithelium.** (Snelle diagnose post mortem van influenza met behulp van cytologische praeparaten van het trachea-epitheel)
J. F. P. HERS and J. MULDER. *Nederlandsch Tijdschrift voor Geneeskunde* [*Ned. Tijdschr. Geneesk.*] **94**, 1997–2002, July 15, 1950. 4 figs., 2 refs.

The changes in the tracheal and bronchial epithelium were studied at necropsy on 8 patients in whom bronchial and pulmonary changes had rapidly terminated in death. In 6 of these cases, in which the influenza-A virus was isolated, the regenerating epithelium was found to be undifferentiated. This was observed at necropsy in moist preparations stained with methylene blue. In 2 cases without virus infection there were no epithelial changes. *P. H. M. Schillings* (*Excerpta Medica*)

2332. **Pulmonary Lymphangiectasis and Chylous Pneumonia.** (Lymphangiectasie pulmonaire et pneumonie chyleuse)
J. DELARUE, R. DEPIERRE, and J. ROUJEAU. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **26**, 4906–4917, Dec. 25, 1950. 18 figs., 23 refs.

In 1948, a woman, then aged 40 years, bore a full-term infant and 8 days later developed phlebitis in the left arm. Then followed episodes of nocturnal dyspnoea, tiredness, and loss of weight. Radiographs showed increasing opacity at the left base and increasing reticulation of the right lung. Left pleural puncture produced chyle-like fluid. A phlebogram showed obstruction of the left subclavicular vein. This region was explored, the fibrosed vein removed, and the tributary lymph channels were tied off. The patient became worse and died in March, 1950.

At necropsy the thoracic duct could not be found: the left pleura and the peritoneum contained milky fluid. The right lung weighed 1,380 g., and contained numerous cystic vesicles which were dilated lymphatics. It was markedly consolidated, especially basally. The left lung was aerated and partially collapsed, with the lingula infarcted: some bullae were present. Histologically the lung showed no signs of emphysema. The alveoli were filled with lipophages, causing "chylous pneumonia". The fat stained with Sudan III and Nile blue sulphate and occasional cells took up osmic acid. The Smith–Dietrich reaction was strongly positive in all sections; thus the fat was similar to plasma fats and not due to fatty degeneration or to Niemann–Pick disease. The grossly dilated, cyst-like lymphatics showed, in places, considerable hypertrophy of their muscle walls, especially in the hilar region, where the muscle almost resembled leiomyomata. Dilated and hypertrophied minor lymphatics were found in the mediastinum and at the site of operation in the left subclavicular region.

Anthracotic deposits were seen in the Kupffer cells of the liver, possibly evidence of a disordered lymphatic circulation. The lymphatic condition is considered to be acquired. Possibly the muscle hypertrophied to enable the lymphatics to drive the lymph on against the obstruction which was begun by the puerperal thrombosis and accentuated by the surgical exploration.

Peter Harvey

2333. **Patterns of Pulmonary Fibrosis as Related to Pulmonary Function**
D. M. SPAIN. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1150–1163, Nov., 1950. 1 fig., 20 refs.

Fibrosis of the lung may be bronchiolar, interstitial, parenchymatous (intra-alveolar), vascular, or pleural. The clinical manifestations of fibrosis of the lung are frequently quite different from what would be inferred from the radiological appearances. All the more is this the case when the physical signs revealed by ordinary

clinical examination are compared with the symptoms as disclosed by the patient. There is frequently a very marked discrepancy between the fully credited complaints of the patient and the revelations made by clinical and radiological examination. Some would go even farther and assert that there is no correspondence at all between the physical signs and the symptoms or, if there is any correspondence, that it is accidental and illusory.

The explanation of these discrepancies is that pulmonary fibrosis may take one of many different forms. The common form is that of fibrosis of alveolar distribution. Obviously the symptoms in such a case would be those of anoxia. The second common type of pulmonary fibrosis is a so-called interstitial progressive bilateral form with symptoms of dyspnoea on exertion or even at rest. The third form of pulmonary fibrosis involves the vascular tree with considerable impediment to the circulation throughout the lung field. In the fourth type, the fibrosis may be predominantly hilar, with sundry symptoms and signs of obstruction and impediment to the circulation. Finally, the fibrosis may be of mixed type with all the confusing signs and symptoms which such a mixture involves. There is no precise clinical mode of investigation which will enable a clinician to identify a particular type of fibrosis. The best one can do is to be aware of the different types of induration which may be found in abnormal lung tissue and to beware of trying to secure too fine a correspondence between physical signs, radiological picture, and clinical symptoms. *G. F. Walker*

2334. **Pulmonary Haemosiderosis of Cardiac Origin**
A. C. LENDRUM. *Journal of Pathology and Bacteriology* [*J. Path. Bact.*] **62**, 555–561, Oct., 1950. 14 figs., 20 refs.

The histological changes found in the lungs in haemosiderosis of cardiac origin are described. The haemosiderosis which results from prolonged left-ventricular failure is indistinguishable from that due to mitral stenosis. These focal accumulations of haemosiderin are believed to be the end-result of haemorrhages from the broncho-pulmonary anastomoses in the mucosa of the terminal bronchioles. The haemorrhages are believed to follow varicose distension of the anastomoses brought about by raised pressure in the pulmonary arteries, the exit side of the anastomoses. In mitral cases the increase is absolute and persistent; in cases with remittent left-ventricular failure there are periodic falls in the bronchial-arterial pressure. From the accumulations of siderophages in the group of alveoli which constitutes the focus, soluble iron reaches the adjacent stroma and there produces damage followed by reactive changes. These in turn, by lymphatic obstruction, tend to perpetuate the accumulation and so accelerate the vicious circle.—[Author's summary.]

2335. **Mediastinal Lymphadenopathy in Cardiac Disease.** (Les adénopathies médiastinales des cardiaques)
Y. BOUVRAIN and J. BESCOL-LIVERSAC. *Archives des Maladies du Cœur et des Vaisseaux* [*Arch. Mal. Cœur*] **43**, 961–967, Nov., 1950. 5 figs.

2336. **Endocardial Fibro-elastosis: a Study of Eight Cases**
J. T. PRIOR and T. C. WYATT. *American Journal of Pathology* [*Amer. J. Path.*] **26**, 969–987, Nov., 1950. 11 figs., 15 refs.

The authors report 8 cases of endocardial fibro-elastosis. The lesion consists of a fibro-elastic thickening of the endocardium which is usually situated on the left side of the heart and may be associated with valvular disease. The condition is probably, however, a distinct congenital abnormality of the nature of a tissue dysplasia, and not inflammatory. In one of the 8 cases the infant was stillborn. The condition is most often seen at necropsy in infants under one year, but it is thought possible that some children with this cardiac malformation do attain adult life, such adults being those in whom there are unaccountable patches of endocardial thickening. The onset of symptoms is characteristically sudden, with cyanosis and congestive heart failure. It is thought that the condition impedes the action of the heart mechanically. *D. M. Pryce*

2337. **The Interrelation of Elastic Tissue and Calcium in the Genesis of Arteriosclerosis**
H. T. BLUMENTHAL, A. I. LANSING, and S. H. GRAY. *American Journal of Pathology* [*Amer. J. Path.*] **26**, 989–1009, Nov., 1950. 13 figs., 31 refs.

The fundamental age change in the main arteries of man is medial calcification. This proceeds at different rates in different arteries, being most rapid in the iliac arteries and slowest in the aorta and hepatic artery. The changes in the coronary and renal arteries proceed at an intermediate rate. The calcification appears to be associated with certain alterations in the physical character and distribution of elastic tissue. Atheroma is secondary to these medial changes.
D. M. Pryce

2338. **The Histology of the Liver in Diabetes.** (L'aspect histologique du foie au cours du diabète: son intérêt théorique)
P. CAZAL and J. MIROUZE. *Presse Médicale* [*Pr. méd.*] **61**, 1077–1079, Oct. 4, 1950. 8 figs.

This paper is a summary of a thesis by one of the authors. It is based on the histological study of liver biopsies from 37 diabetic patients before and after treatment with insulin. The lesions observed concerned glycogen, nuclear anomalies, and fatty changes. Normally glycogen is distributed evenly in the liver lobules, but centrilobular apparent increase may result from loss of glycogen from the periphery of the lobule due to insulin. Increase of glycogen in the periphery or around the portal tracts is always abnormal and signifies centrilobular loss, possibly due to adrenaline, or formation of excess glycogen under the influence of the pituitary. Variations in the size of the nucleus and the presence of 2 or 3 nuclei in liver cells indicate morbid states of the liver. Vacuolation of nuclei may be slight or may reduce the nucleus to a mere shell. The theory that these changes are due to glycogen is not proven. The authors believe that they indicate catabolic processes of nucleoproteins

with liberation of uric acid and pentoses. Fatty changes in liver cells are very common, ranging from fine cytoplasmic droplets to masses of fat pushing the nucleus aside or even causing its atrophy. If the cell is alive, these changes are reversible, but fat droplets may persist a very long time. Perilobular and centrilobular fatty changes ("steatosis") are seen. The latter indicate insulin-deficiency. Sometimes diffuse changes develop. Little grains of yellow intracellular pigment, not giving staining reactions for iron, are sometimes seen in the centre of the lobules.

Three types of lesion can be distinguished, roughly corresponding to the 3 types of experimental diabetes. In 7 cases of diabetes, controlled easily by 30 to 60 units of insulin per day and without vascular disturbances, there were mainly centrilobular fatty changes and only little glycogen, but no nuclear changes. After insulin therapy the fat disappeared and glycogen reappeared and occasionally became excessive. This type corresponds to diabetes in pancreatectomized animals. The adrenal type was found in 10 cases in which little insulin was needed, but vascular complications were common. This group consisted of 4 women at the menopause, 4 elderly subjects, and 2 adolescents. Vacuolated nuclei were frequent and glycogen was excessive. Fatty changes were sometimes seen, and only these disappeared with insulin. The clinical appearance and glycogen excess are similar to findings in experimental diabetes of adrenal origin. In a mixed group of 14 patients with variable insulin requirements mainly peripheral fatty change did not yield to insulin treatment. Vacuolated nuclei were numerous and glycogen was in excess. Possibly the pituitary was at fault in this group. In 2 cases difficult to classify there was evidence of hepatitis and slight fibrosis. Diabetic coma occurred more often in the second or third group. *E. Neumark*

2339. **Unilateral Atrophy or Lobar Hypoplasia of the Liver. Studies of the Morphology and Pathogenesis of Some Rare Typical Hepatic Deformities, and their Relation to the Theory of Laterality.** (Unilaterale Leberschwunde oder Lappenhypoplasien der Leber? Studien über Morphologie und Pathogenese einiger seltener typischer Verformungen der Leber und ihre Beziehungen zur Theorie der Bilateralität)
W. W. Meyer. *Archiv für Pathologische Anatomie und Physiologie* [*Virchows Arch.*] **319**, 127–230, 1950. 25 figs., bibliography.

A description is given of 14 cases of atrophy or hypoplasia of one of the halves of the liver: 7 of them concern the right, 7 the left half. The atrophy of one half is regularly combined with hypertrophy of the other half of the organ; this causes characteristic changes in the configuration of the organ, described in detail. The resulting form is based on the division of the liver into two halves with independent vascular and ductal supply; the boundaries of the two halves do not coincide with the visible partition of the liver into right and left lobes. These cases are usually interpreted as congenital malformations (aplasia, agenesia), but this view cannot be supported. Until now not a single case has been observed in a newborn infant or in a baby. On the other hand, certain pathological changes have been found which permit an aetiological explanation: obstruction of one of the main branches of the hepatic duct (cholangitis obliterans), or of the portal vein, or of the liver veins, or toxic alterations in one half of the organ. Clinically, the abnormal configuration of the liver and the unusual position of the gall-bladder may cause difficulties in diagnosis. *O. Neubauer*

2340. **The Influence of Mechanical Limitation of Blood Flow on the Development of Endophlebitis Obliterans Hepatica.** (Über den Einfluss mechanische bedingter Strömungsverhältnisse bei der Entstehung der Endophlebitis obliterans hepatica)
L. Kuesko and K. Portele. *Klinische Medizin* [*Klin. Med., Wien*] **5**, 558–565, Dec. 1, 1950. 27 refs.

The authors describe the necropsy findings in a case of hepatic endophlebitis. The patient, a woman of 32, died after an illness lasting about 4 months which started with diarrhoea and vomiting, followed by jaundice. The immediate cause of death was haemorrhage from burst oesophageal varices. The liver was small, measuring $22 \times 13 \times 9$ cm., and was of small granular appearance with thickened whitish capsule. Both branches of the hepatic veins were completely occluded by greyish-white, spongy tissue which was traced upwards to the larger intrahepatic veins. The caudate lobe was smooth in outline and possessed direct and patent communications with the inferior vena cava. Histologically, only a narrow subcapsular zone proved to be fairly normal in structure and appearance. Elsewhere there were pronounced central necrosis and dissociation of liver cells, while the sinusoids were clogged with blood plasma incorporating a small number of leucocytes. Occasionally the cells in the central portions were outlined by bile-pigment deposits. The anaemic centres contrasted sharply with the congested peripheral parts, which had linked up, and gave the picture of stasis of blood. The elastic fibres of sublobular and medium-sized liver veins were frayed, clumped together, and covered with fibrinoid masses incorporating many erythrocytes. In the smaller branches these intimal proliferations were sickle-shaped or circular, but more distally soon started to occlude the vessel lumina completely. In the caudate lobe the appearances differed in that the structure of the organ was better preserved in spite of anastomosing areas of necrosis. Some sublobular veins showed patchy necrosis of their walls while the remaining parts were unaltered. In the medium-sized veins intimal proliferations were similar to those present in the main part of the organ, progressing occasionally to complete occlusion, but the large veins had remained unchanged. The spleen showed subcapsular necrosis, while the trabecular veins and arteries were similarly affected. A number of Aschoff bodies were found in the heart muscle. Otherwise the organs were healthy.

The authors supply a mechanical explanation for the histological changes observed in the liver. In the main part of the organ, owing to reduced drainage of blood through the occluded hepatic veins, the surviving liver

cells arranged themselves around the portal system, thereby obscuring the normal liver structure, while in the caudate lobe, where only a small number of minor veins were obstructed and consequently drainage of blood must be presumed to have been satisfactory, the structure of the tissues had remained unchanged in spite of patchy necrosis similar to that observed throughout the organ.

R. Salm

2341. **Irreducible Folds in the Internal Elastic Lamina of the Renal Arteries**

B. E. HEARD. *Journal of Pathology and Bacteriology* [*J. Path. Bact.*] **62**, 591–596, Oct., 1950. 11 figs., 12 refs.

The renal arteries removed post mortem from 42 subjects, all over the age of 40, were examined for folds in the internal elastic lamina. Segments of the vessels were distended with formol-saline under pressure and frozen sections were stained with Sudan III and haemalum or orcein and haemalum. This treatment revealed the presence in 10 pairs of renal arteries of irreducible transverse ridges within their lumina. On microscopical examination the ridges were seen to consist of folds of internal elastic lamina which had become bound down to the underlying intima by connective tissue. Deposits of fat were demonstrated in most folds and there was thickening of the intimal covering.

The pathogenesis of the condition is discussed at some length, and the theory is advanced that the lesion results from a break in the lamina through which a weakened part of the intima is pulled by the underlying tunica muscle. Folds were not found in cerebral, radial, splenic, or coronary arteries, or in the renal arteries of subjects under the age of 40. Hypertension was not a predisposing cause, and there was no obvious connexion between the diseases which led to death and the presence of folds in the renal arteries. *G. B. Forbes*

2342. **Polycystic Disease of the Kidneys and Spina Bifida in One Family.** (Familiair voorkomen van cystenieren en spina bifida)

D. P. R. KEIZER and H. A. LAAN. *Nederlandsch Tijdschrift voor Geneeskunde* [*Ned. Tijdschr. Geneesk.*] **94**, 2741–2745, Sept. 23, 1950. 5 refs.

The authors describe a family of 7 siblings, 3 of whom died in the first day of life from bilateral renal tumours. Necropsy in one of these showed a cystic renal malformation belonging to a late stage of renal development. Pyelography in the other members of the family revealed nothing abnormal in the kidneys, but showed that the mother and her 4 other children had a spina bifida in the region of L5 and S1. The possible relation between these two findings is discussed.

A. Middelhoven (*Excerpta Medica*)

2343. **The Pathology of Fatal Carbon Tetrachloride Poisoning with Special Reference to the Histogenesis of the Hepatic and Renal Lesions**

H. D. MOON. *American Journal of Pathology* [*Amer. J. Path.*] **26**, 1041–1057, Nov., 1950. 12 figs., 15 refs.

The findings at post-mortem examination on 12 patients who died from carbon tetrachloride poisoning are described. All but one of the patients were alcoholics, an association which appears to be synergistic. The hepatic lesion was very extensive in those who died within 4 days of exposure to the carbon tetrachloride; those who lived longer were thought to have taken less poison, so that there was more time for regeneration. The renal lesion, on the other hand, tended to be worse in those who survived longest. It began in the first convoluted tubule and later became more extensive and of the "lower nephron" type. There was pulmonary oedema, with uraemic lesions in the pancreas.

D. M. Pryce

2344. **Observations on the Reduction of Triphenyl Tetrazolium Chloride by Normal and Malignant Human Tissue**

M. M. BLACK, S. R. OPLER, and F. D. SPEER. *American Journal of Pathology* [*Amer. J. Path.*] **26**, 1097–1102, Nov., 1950. 7 refs.

The reduction of tetrazolium salts to coloured formazans provides a means of studying dehydrogenase activity of cells in thin slices of fresh tissue. The slices are hand-cut, incubated, and then fixed and examined. The nucleus is not coloured. In the cytoplasm in some cases the formazan appears as fine granules, while in others there is diffuse staining. Most epithelial cells colour deeply; usually stromal and lymphoid tissue does not. It is doubtful if there is any difference between normal and malignant cells in their dehydrogenase activity, but stroma around deeply-staining malignant cells tends to stain diffusely. The method shows well the topographical relations of infiltrating carcinoma. The reaction, accelerated by light, has been used in the rapid examination of biopsy material. *D. M. Pryce*

2345. **Fatal Gastroenteritis with Toxic Symptoms in Young Infants. Clinical Studies and Post Mortem Examinations.** [In English]

N. HALLMAN and E. K. AHVENAINEN. *Annales Medicinae Internae Fenniae* [*Ann. Med. intern. fenn.*] Suppl. 7, **39**, 1–23, 1950. 43 refs.

The clinical aspects are reported briefly, and the post-mortem findings fully, in a series of 48 cases of gastro-enteritis in infants: 23 under 3 months old, 15 from 3 to 6 months, and 10 older than 6 months. Data include a number of estimations of plasma non-protein nitrogen, chloride, and protein level and alkali reserve.

The naked-eye and microscopical changes were characteristically insignificant: in the intestine there was evidence of inflammatory change in only 3 cases; the liver almost invariably showed the typical fatty change, the fat accumulation generally being less marked in those babies whose nutritional state at onset was poor, and not related obviously to either the severity or the duration of the disease. In the kidneys fatty change was found in 30 cases; pelvic concretions were found in one. In the adrenals marked cortical lipid depletion was unusual. The lungs in many instances showed early descending infection (the majority had received sulphonamides and penicillin). Occasional changes of doubtful significance are recorded in the spleen, central nervous

system (sagittal sinus thrombosis in one case), heart, and pancreas.

The authors find no correlation between biochemical and post-mortem abnormalities, and potassium depletion is only briefly considered. *W. S. Killpack*

2346. **The Synovial Membrane. Some Observations in Normal and Arthritic Human Joints**
K. MAUNSELL, F. WRIGLEY, T. C. HIGHTON, and L. B. HOLT. *Annals of the Rheumatic Diseases* [*Ann. rheum. Dis.*] **9**, 363–371, Dec., 1950. 5 refs.

This investigation was aimed at discovering the degree of transfer of immune bodies from the serum to the synovial fluid of the knee-joint. From studies on 3 volunteers it was shown that the normal α and β agglutinins of the serum are not recognizable in the fluid, and that after immunization of one volunteer with diphtheria toxin the serum titre of antitoxin was 200 units per ml., whereas in the synovial fluid it was only 15 units. Synovial effusions were then studied from cases of widely different types of arthritis, including osteo-arthritis, and in all the fluids there was a titre of iso-agglutinin virtually equal to that in the serum. It is thus argued that the barrier, presumed to be the wall of the periarticular capillaries, had lost its function. A similar passage was demonstrated of an acquired antibody into an osteo-arthritic knee-joint.

The group-specific substances A and B were sought in the synovial effusions of a series of 18 arthritic patients who were salivary secretors. Although study of synovial fluid was technically difficult, it was concluded that the blood-group substances are not present in mucinous fluids of mesenchymal origin, even when they are abundant in the saliva. *A. C. Lendrum*

2347. **Valvular Thrombotic Vegetation in Newborn ("Fetal Endocarditis")**
R. H. MCDONALD. *Archives of Pathology* [*Arch. Path.*] **50**, 538–544, Nov., 1950. 2 figs., 10 refs.

CLINICAL PATHOLOGY

2348. **Net Splanchnic Glucose Production in Normal Man and in Various Disease States**
J. D. MYERS. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1421–1429, Nov., 1950. 38 refs.

The author studied the net splanchnic glucose production and the hepatic arterio-venous glucose difference in 38 healthy subjects, 8 patients convalescent from chronic infections, 9 cases of diabetes mellitus treated with insulin, 10 cases of hyperthyroidism, 8 cases of congestive cardiac failure, and 18 cases of Laënnec's cirrhosis of the liver, in 11 of which the diagnosis was confirmed by liver biopsy or at necropsy. It was concluded that the net splanchnic glucose production, at a constant arterial concentration of glucose, approximated to the rate of peripheral glucose utilization, and was equal to $64{\cdot}6\pm3{\cdot}7$ mg. per minute per sq. m. body surface in the normal subjects. In these subjects the hepatic arterio-venous glucose difference was $8{\cdot}5\pm0{\cdot}4$ mg. per 100 ml. In the patients with diabetes mellitus or thyrotoxicosis and those convalescent from chronic infections the results did not differ significantly from these. In the patients with Laënnec's cirrhosis the hepatic arterio-venous glucose difference was $7{\cdot}2\pm0{\cdot}5$ mg. per 100 ml., a figure not significantly lower than that seen in the normal subjects. The net splanchnic glucose output, however, was significantly lower, being $49{\cdot}1\pm3{\cdot}6$ mg. per minute per sq. m. There was a significant increase in the hepatic arterio-venous glucose difference in the patients suffering from cardiac failure, the average being $11{\cdot}5\pm1{\cdot}0$ mg., while the net splanchnic glucose production was $50{\cdot}1\pm4{\cdot}3$ mg. per minute per sq. m., which was not significant in such a small group.

Slow infusion of glucose abolished the hepatic arterio-venous glucose difference when the rate of infusion slightly exceeded the net splanchnic glucose production immediately before the glucose infusion was started. When the infusion rate was below the rate of splanchnic glucose production, there was no effect on the hepatic arterio-venous glucose difference.

Walter H. H. Merivale

2349. **Mucolytic Enzyme Systems. XI. Hyaluronidase Inhibitor and Serum Mucoproteins in Patients with Lipoid Nephrosis and Acute Glomerulonephritis**
V. C. KELLEY, R. A. GOOD, and D. GLICK. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1500–1504, Nov., 1950. 1 fig., 10 refs.

The authors, whose investigation was carried out at Minnesota University Medical School, found that in cases of lipoid nephrosis the mean serum concentration of mucoprotein tyrosine was only 68% of normal, while that of the hyaluronidase inhibitor was more than twice the normal. During the course of the illness the level of the hyaluronidase inhibitor remained high after temporary clinical remission; where clinical and laboratory evidence pointed to complete remission of the disease the level fell to within the normal range. It was concluded that a high level of hyaluronidase inhibitor in the serum indicates continued activity of the disease process in nephrosis. Serum mucoprotein levels might be raised in the early and late stages.

In acute nephritis the levels in the serum of hyaluronidase inhibitor and mucoprotein were raised, but fell towards normal during convalescence. Serial determinations during the course of the disease indicated that they reflected the degree of activity of the process. The serum level of the hyaluronidase inhibitor was the first to become normal, followed by that of serum mucoprotein and then by the erythrocyte sedimentation rate, during convalescence. *Walter H. H. Merivale*

2350. **Diagnostic Value of the Blood Pattern in Cancer**
H. L. BOLEN. *American Journal of Surgery* [*Amer. J. Surg.*] **80**, 505–513, Nov., 1950. 6 figs., 5 refs.

A simple test is described by which, it is claimed, the blood of a patient suffering from carcinoma can be distinguished from normal blood. Drops of blood are allowed to dry on a slide and examined macroscopically and microscopically. Macroscopically, the drop of

normal blood has a dark central mass, not seen in the drop of blood from a patient with carcinoma. Microscopically, in the former the erythrocytes are evenly arranged in rouleaux and divided into a fine mosaic by a fibrin mesh; in the latter, the erythrocytes are irregularly agglutinated without rouleau formation, lying clumped together in masses leaving large areas of plasma, and there is little or no fibrin mesh. The test was tried on four groups, totalling 800 people. It brought to light 2 cases of carcinoma in 137 apparently normal hospital employees. In 337 patients suffering from diseases other than carcinoma there were no positive reactors. Among 198 proved cases of carcinoma there were 7 negative reactors (4 cases of basal cell carcinoma, 1 of carcinoma of the pancreas, 1 of carcinoma of the lung, and 1 of carcinoma of cervix). Finally, in 128 cases of carcinoma tested before and after various types of therapy, changes in the blood pattern usually ran parallel to the clinical course. The test is said to be positive in pregnancy, and unreliable after blood transfusions.

[This report, though lacking in precision, draws attention to a phenomenon which may repay further investigation.] *M. H. Salaman*

2351. **Heat Coagulation of the Cerebrospinal Fluid.** (Zur Hitzekoagulation im Liquor cerebrospinalis)
W. HOLZER and A. STEINBÄCKER. *Wiener Zeitschrift für Nervenheilkunde* [*Wien Z. Nervenheilk.*] **3**, 210–217, 1950. 5 figs., 7 refs.

Rosegger's coagulation test was applied to 200 patients suffering from organic nervous diseases and from mental disorders. In the test, 10 testtubes are set up containing 1 ml. of calcium chloride solution in decreasing concentrations (5·0, 3·75, 2·5 2·0, 1·5, 1·0, 0·75, 0·5, 0·25, 0·05%); and to each 0·4 ml. of cerebrospinal fluid is added and the whole heated for 15 minutes in boiling water. The degree of flocculation or coagulation was compared with that in the Pandy, Nonne–Appelt, mastic, Nissl, and Wassermann tests. Pathological heat coagulation (H.C.) was found in 84·5% of the cases, in some instances in those which had not shown abnormality with the other tests. On the other hand, all cases with a normal H.C. showed scarcely any abnormality with the other tests. In 10 of 14 cases of general paresis a highly abnormal reaction was present: in 4 of them a characteristic curve could not be established. Remarkable results were obtained in 6 cases of schizophrenia, 5 showing a moderately abnormal reaction when all other reactions were normal. The sixth case had a highly abnormal H.C. and a moderate increase in protein. In acute excitement states, arteriosclerotic dementia, imbecility, and idiocy, H.C. was moderately or highly abnormal and of 4 cases of depression one had a normal, one a weak, and two an abnormal reaction. *F. F. Kino*

2352. **Colloidal Gold Reaction in Multiple Sclerosis**
T. J. C. VON STORCH, T. LAWYER, and A. H. HARRIS. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 668–675, Nov., 1950. 3 figs., 11 refs.

2353. **Renal-tract Delay Time and Dead Space**
R. R. MCSWINEY and H. E. DE WARDENER. *Lancet* [*Lancet*] **2**, 845–846, Dec. 23, 1950. 2 figs., 5 refs.

When urine is collected through a urethral catheter some time must elapse between its formation and its appearance. The authors attempted to estimate the time needed for passage through the renal collecting tubules, calices, pelvis, ureter, bladder, and the urethral catheter and the volume of these structures—the "renal-tract delay time", and the "renal tract dead space". Their calculations depended on the principle that if the dead space was x ml. and the urine flowed at v ml. per minute, the delay time was $\frac{x}{v}$. Thus as urine flow is easily measured, if either the delay time or the dead space is known the other can be calculated.

In 17 individuals urine flow was repeatedly measured for several minutes, a multi-eyed catheter with internal volume of 2 ml. being used. Then 0·6 g. of sodium *para*-aminohippurate in 20 ml. of isotonic saline was injected intravenously. In a few cases methylene blue was also injected. Collection of urine was instantly started again. The appearance of the hippurate was shown by the Bratton and Marshall colour test (Bratton and Marshall, *J. biol. Chem.*, 1939, **128**, 537). At first the hippurate (or in 5 cases methylene blue) was absent from the urine, then gradually a maximum concentration was reached. There was no clear-cut end-point. This showed that mixing took place in the dead space, making its accurate estimation impossible. Nevertheless, the dead space could not be smaller than the volume collected up to the first appearance of hippurate, nor could it be larger than the volume of urine collected up to the appearance of the maximal hippurate concentration. Correcting for circulation time from arm to kidneys of 12 to 18 seconds, the average renal-tract delay time was about 2·1 minutes (between 1·3 and 2·8 minutes). This applied best at a urine flow from 2 to 14 ml. per minute. The calculated dead space was between 4·4 and 30·7 ml.

The constancy of delay time with the wide variation in dead space suggested to the authors that the renal dead space can expand from 5·4 to 30·7 ml., and indeed several individuals showed such wide variations in dead space on repeated observations. The authors injected normal saline solution into the bladder and withdrew it promptly, but only obtained the same amount of fluid plus the expected urine volume. They concluded, therefore, that the site of dead space expansion was not the bladder, but the renal pelves and/or the tubules.

H. Lehmann

2354. **The Significance of the Plasma Tocopherol Concentration and of Tocopherol Tolerance Tests in Liver Disease**
G. KLATSKIN and W. A. KREHL. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1528–1541, Nov., 1950. 1 fig., 47 refs.

The authors studied the plasma tocopherol level in 23 healthy subjects, 57 convalescent controls without liver disease, and 43 patients with various types of liver disease. The mean plasma tocopherol concentration,

fasting, in the healthy subjects was 1·23±0·31 mg. per 100 ml.; in the convalescent controls it was 1·02±0·37 mg. per 100 ml.; and in the patients with liver disease 0·95±0·32 mg. per 100 ml. The concentration in the patients with liver disease was significantly lower than in the healthy subjects, but did not differ significantly from that in the convalescent controls. The range of values in the patients with liver disease was significantly wider than in the healthy group, but did not differ significantly from the range seen in the convalescent controls. There was no significant difference in the plasma tocopherol levels observed in the patients with various types of liver disease.

The oral administration of 500 mg. DL-α-tocopheryl acetate resulted in a significant rise in plasma tocopherol concentration in all except 4 of the patients with liver disease and in all the convalescent controls; the mean increase in the former group was significantly less than in the latter. When D-α-tocopheryl di-sodium phosphate was given orally the maximum rise in plasma concentration did not differ significantly from that seen after administration of the acetate. Intramuscular injection of DL-α-tocopherol in the patients with liver disease and the convalescent controls was followed by a significantly smaller increase in plasma tocopherol concentration than that which followed oral administration of DL-α-tocopheryl acetate. *Walter H. H. Merivale*

2355. **Criteria for and Interpretation of Normal Glucose Tolerance Tests**

H. O. MOSENTHAL and E. BARRY. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1175–1194, Nov., 1950. 4 figs., 35 refs.

This article brings up to date the purely technical aspects of estimating blood sugar and tolerance to sugar in diabetics and normal persons, with a critical examination of the shortcomings of certain procedures hitherto thought to be accurate [but it is not adequate as regards clinical applications]. Since the general adoption of biochemical studies in all cases of glycosuria there has inevitably accumulated in hospital practice a large number of fallacies and, as everyone knows, once a fallacy is enshrined in the writings of clinical practice it takes many generations to eradicate it. There are many fallacies in connexion with such simple things as the estimation of blood sugar level, and still more fallacies when it comes to the interpretation. Clinicians will find an exposition of the difference between arterial and venous blood in blood sugar estimations, and how far simple changes in mechanical procedures in the taking of blood for estimations can substantially alter the value. There is also an examination of many widely held notions about the difference in tolerance at various ages and in various circumstances of impaired health and also in various conditions of recumbency or activity.

There is an analysis of the blood sugar levels in 50 normal persons, all well and ambulant and divided into three groups, namely, aged 16 to 38, aged 39 to 59, aged 61 to 76. In each case the blood sugar level was studied fasting, half an hour after 100 g. of glucose (not 50 g. as in Britain), one hour after the glucose, and 2 hours after the glucose. Two estimations were made on venous blood, one of the "true blood sugar" and one by the Folin–Wu method. A third specimen was also taken of the arterial blood, giving the capillary "true blood sugar". The result is an impressive table of normal figures, impossible to condense, resembling nautical tide tables in a yachtsman's almanac and conforming fairly well to current European figures.

[Many of the charts and diagrams presented do not lend themselves to summarization as they are already condensed to the last possible syllable.]

G. F. Walker

2356. **Hyaluronidase Inhibitor of Human Blood Serum in Health and Disease**

D. GLICK. *Journal of the Mount Sinai Hospital* [*J. Mt Sinai Hosp.*] **17**, 207–228, Nov.–Dec., 1950. 3 figs., 21 refs.

The author describes the results of an investigation into the effects of various diseases on the level of non-specific inhibitor of hyaluronidase in serum as estimated, by the viscosimetric method of Glais and Glick (*J. invest. Derm.*, 1948, **11**, 259). The blood level of hyaluronidase inhibitor was measured in 27 cases of poliomyelitis and the results compared with those in 30 normal subjects. A significant elevation above the normal was found, and follow-up studies on 9 patients showed that the magnitude of the inhibitor value was proportional to the severity of the disease. Similar results were obtained on 3 monkeys and 128 mice which had been experimentally infected. In order to test the specificity of this phenomenon, measurements were made on 127 patients with a wide variety of bacterial and virus diseases and the values compared with those obtained from 211 normal sera. It was concluded that the elevation of inhibitor values in blood serum in infectious diseases was non-specific, but that an essential requirement for elevation was acute systemic involvement. The effect of vaccinia vaccination on the serum inhibitor level of 35 college students was also studied; in 16 individuals with immune reactions negligible changes in the inhibitor level were observed, but in the other 19 subjects the magnitude of the elevation paralleled the intensity of the reaction.

The author found a significant elevation of serum inhibitor level in 20 cases of acute rheumatic fever and again in 10 cases of acute streptococcal pharyngitis. Subnormal inhibitor values were observed in 10 cases of convalescent rheumatic fever and in 50 cases of inactive rheumatic fever; it is suggested that the lowered inhibitor level might be a factor in enhancing the susceptibility of these patients to rheumatic disease. In 5 children suffering from hypoglycaemia and treated with 9 mg. of adrenocorticotrophin (ACTH) every 6 hours over a 4-day period it was found that a significant rise in the serum inhibitor level was produced by the ACTH treatment and that it reverted to slightly below the pre-injection level 7 days after the termination of hormone therapy. The abnormally high serum inhibitor levels found in cases of rheumatic fever were reduced to normal during ACTH treatment, but rose again when therapy was discon-

tinued. Significant elevations of serum inhibitor level were observed in animals subjected to stress, and it was found in rats that adrenalectomy abolished the rise in the serum inhibitor level normally caused by chilling. It was concluded that the adrenal cortex may play an essential role in controlling the fluctuation of serum hyaluronidase inhibitor level.

An investigation of the occurrence of hyaluronidase in human malignant tissue was undertaken, and clean, non-necrotic specimens of tissue obtained under sterile conditions from 4 benign and 6 malignant tumours were extracted under aseptic conditions. Specimens from 25 malignant tumours and 25 specimens of normal tissue which were directly contaminated by bacteria were also extracted, and it was found that neither benign nor malignant tumours possessed any hyaluronidase activity other than that contributed by micro-organisms containing the enzyme. Significantly high serum concentrations of hyaluronidase inhibitor were found in 32 cases of malignant tumour which had undergone metastasis, as compared with 75 normal subjects and 25 cases of benign and 30 of malignant but non-metastatic tumour. It was concluded that elevation of the serum inhibitor level occurs in cancer only when the disease has progressed to the stage of a systemic reaction.

M. J. H. Smith

2357. **Erythrocyte Sedimentation in Anaemia**
R. TERRY. *British Medical Journal* [*Brit. med. J.*] **2**, 1296–1299, Dec. 9, 1950. 2 figs., 29 refs.

Erythrocyte sedimentation rates (E.S.R.) were measured by the Westergren technique (0·4 ml. of 3·8% sodium citrate and 1·6 ml. of blood, in a 200-mm. tube). The upper limit of normal was assumed to be 10 mm. in an hour. The distribution of values falling within the usual range was determined in 367 normal women and 228 normal men, all with haemoglobin concentrations greater than 86% (Haldane), and in 160 women with a simple hypochromic anaemia who had a haemoglobin concentration of 86% or less. For normal women the mean was 4·72 mm. in an hour, the mode 3 mm., and the standard error ±0·11 mm.; for normal men the mean was 3·82 mm., the mode 2 mm., and the standard error ±0·13 mm., these results being significantly different from those for women. For anaemic women the mean was 4·79 mm. in an hour, the mode 3 mm., and the standard error ±0·15, showing no significant difference from figures for healthy women.

Sixty examples are described of normal E.S.R. in women with severe anaemia (haemoglobin level less than 60%) due to simple blood loss. In those cases of anaemia where the E.S.R. was raised some cause, other than the anaemia, was always found. Twenty typical examples are given. In 4 cases the E.S.R. increased as the haemoglobin level rose on treatment, although there was no clinical evidence of increased activity of the disorder responsible. Anaemic blood, diluted with its own citrated plasma, showed a smaller increase in E.S.R. than normal blood so treated.

The author concludes that, contrary to the widely held belief that the E.S.R. is increased in anaemia, there is actually an increased suspension stability of the erythrocytes. All corrections for anaemia based on experiments with normal blood are invalid.

M. Lubran

2358. **The Counting of Blood Cells by Phase Microscopy**
G. CROSSMON. *American Journal of Clinical Pathology* [*Amer. J. clin. Path.*] **20**, 1041–1043, Nov., 1950. 1 fig.

This method gives a ready differentiation of leucocytes from dust particles in the counting chamber. The high refractive index and shape of the nucleus distinguishes lymphocytes from polymorphonuclears for approximate differential count. Change in shape of erythrocytes is more apparent, but may depend upon the diluting fluid; the cells become swollen in a hypotonic solution with alteration in their refractive index. It is necessary to use a thin coverglass and ensure that the under surface of the haemocytometer has no concavity.

E. T. Ruston

2359. **The Common Causes of Lymphopenia**
A. J. SHILLITOE. *Journal of Clinical Pathology* [*J. clin. Path.*] **5**, 321–331, Nov., 1950. 9 refs.

The laboratory findings, diagnoses, and main clinical features of 87 cases of a lymphopenia of 1,000 lymphocytes per c.mm. or less, found in a total of 647 differential counts, are tabulated. The youngest patient was a boy of 8 years, an epileptic on troxidone therapy, the eldest a woman of 83 with "pericolitis". Cardiac disease was present in 20 cases. This high incidence may be due to the selection of cases admitted to the Kingston General Hospital, Hull. The remaining cases included a wide diversity of diagnoses. Mostly the prognosis appeared to be that of the primary disease. Of the 5 patients with tuberculosis (including respiratory and non-respiratory forms), 4 were dead within 2 months and the fifth was lost sight of. *Harold Caplan*

2360. **Determination of Serum Prothrombin with a Two-stage Method, Using Alcohol to Block Antithrombin Activity.** [In English]
N. HERZ, A. DE VRIES, and E. HEIMAN-HOLLANDER. *Acta Medica Scandinavica* [*Acta med. scand.*] **138**, 211–218, 1950. Bibliography.

A modification of Sternberger's two-stage method for the estimation of plasma prothrombin, in which the inactivation of thrombin by antithrombin is prevented by alcohol, was applied to the measurement of serum prothrombin. Clotted blood was oxalated and incubated. Ethanol-saline, commercial thromboplastin, and calcium chloride were added to oxalated serum and the mixture incubated. A sample was added to normal plasma treated with barium sulphate, the end-point being reached when granular clots appeared. The times ranged from 14 to 30 seconds. The amount of prothrombin could be estimated by setting up various dilutions of defibrinated oxalated plasma with a mixture of ethanol, saline, and calcium chloride. Sera from 50 healthy individuals gave values of about 1·25% prothrombin. They were lower than by Quick's method, and one-stage methods of estimation of prothrombin are

considered to be unreliable. The addition of prothrombin and fibrinogen-free plasma did not raise prothrombin values. It is concluded that alcohol prevents the inactivation of thrombin by antithrombin.
E. Neumark

2361. **Observations on Prothrombin Consumption during Clotting of Normal Blood in Glass.** [In English]
A. DE VRIES, N. HERZ, and E. HEIMAN-HOLLANDER. *Acta Medica Scandinavica* [*Acta med. scand.*] **138**, 219–224, 1950. 18 refs.

Oxalate was added to blood at various times after venepuncture, and the amount of prothrombin in plasma or serum was estimated according to the authors' method (see Abstract 2360). Only very small amounts of prothrombin disappear before clotting. Almost all prothrombin is converted into thrombin after clotting, most of it within an hour. A very small portion of the available prothrombin is used up in the induction of clotting. *E. Neumark*

2362. **Studies on Serum Prothrombin in Hemophilia**
A. DE VRIES, E. HEIMAN-HOLLANDER, and N. HERZ. *Acta Medica Scandinavica* [*Acta med. scand.*] **138**, 225–231, 1950. 15 refs.

Blood from a haemophilic patient, in whom the clotting time varied between 80 and 210 minutes and the bleeding time and number of platelets were normal, was studied according to methods previously described (Abstracts 2360 and 2361). Two hours after clotting and 3½ hours after venepuncture hardly any prothrombin was converted into thrombin, but 24 to 48 hours after clotting conversion was marked. When the clotting time was artificially shortened to 4 minutes by the addition of thromboplastin to blood samples, 30 to 40% of prothrombin became converted into thrombin. Prothrombin conversion proceeds slowly but steadily in the serum of the haemophilic subject.
E. Neumark

2363. **A Simply Prepared, Standardized, and Relatively Stable Thromboplastin Extract for Estimation of Prothrombin Time**
S. SHAPIRO, M. WEINER, H. F. LUDDECKE, R. L. KROC, and E. J. WHITE. *American Heart Journal* [*Amer. Heart J.*] **40**, 766–770, Nov., 1950. 6 refs.

2364. **The Plasma Viscosity**
J. S. LAWRENCE. *Journal of Clinical Pathology* [*J. clin. Path.*] **5**, 332–344, Nov., 1950. 2 figs., 8 refs.

Viscosity measurements were made on 700 samples of blood and the complete fractional viscosity method studied in 47 healthy subjects and 245 patients suffering from a wide variety of diseases. Four measurements of viscosity were made in each case: on oxalated plasma, on serum obtained by adding calcium chloride to the plasma, on the filtrate after precipitating a portion of the serum globulin consisting almost entirely of γ-globulin (by adding one part of 4M ammonium sulphate solution to two volumes of plasma), and on the filtrate obtained after a further portion of the globulin had been precipitated by adding one volume of 4M-ammonium sulphate to three volumes of the first filtrate.

The measurements were made in the author's modification of the Ostwald viscometer, in which only 2·5 ml. of plasma is needed. From figures obtained the viscosity differences due to fibrinogen, two fractions of globulin, and the albumin were estimated, after allowance had been made for the contained ammonium sulphate. No attempt was made to estimate the actual viscosity of the fractions isolated. The chief value of the method is to show relative changes. Changes in the viscosity fractions were non-specific, being present in all processes involving tissue damage, and depended more on the stage of the disease process than on its nature.

In acute disorders the fibrinogen and sometimes the second globulin fractions were increased during the first week, the first globulin fraction being unaffected until the second or third weeks. During recovery the changes subsided in the same order. The albumin fraction was often reduced during the early stages and returned to normal after a variable time. In subacute disorders the sequence was identical but the changes took place more slowly, and in chronic disorders the fractions might remain constantly abnormal or show repeated cycles of the above sequence. The erythrocyte sedimentation rate failed in some cases to reflect the changes in plasma proteins and to indicate the presence of tissue damage. Following haemorrhage, the fractions were all reduced and the subsequent order of recovery was: fibrinogen (during the first 24 hours), globulin-II, albumin, and globulin-I (after 2 weeks).

Findings of very high globulin-I and fibrinogen in myelomatosis, high globulin-I in liver disease, and a low value of this fraction in lymph-node disease may occasionally assist in diagnosis. *Harold Caplan*

2365. **The Value and Interpretation of Estimation of the Osmotic Pressure of the Blood Plasma.** (Intérêt et signification de la mesure de la pression osmotique du plasma sanguin)
J. HAMBURGER, J. CROSNIER, and G. MATHÉ. *Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris* [*Bull. Soc. méd. Hôp. Paris*] **66**, 1701–1716, 1950. 5 figs., 35 refs.

2366. **An Evaluation of the Antiproteolytic Reaction of Serum as a Test for Malignant Neoplasia**
E. E. CLIFFTON. *Journal of the National Cancer Institute* [*J. nat. Cancer Inst.*] **2**, 33–50, Aug., 1950. 46 refs.

2367. **The Accuracy of Haematometric Estimations.** (Contribution à l'étude de la sécurité des estimations faites au moyen des hématimètres)
J. J. GILLON. *Sang* [*Sang*] **22**, 23–33, 1951. 2 figs., 7 refs.

2368. **Estimation of Alkali Reserve. A Method for Routine Hospital Use with Small Amounts of Plasma**
H. LEHMANN. *Lancet* [*Lancet*] **1**, 718–719, March 31, 1951. 7 refs.

Microbiology

2369. **Comparison of Influenza B Virus Strains from the 1950 Epidemic with Strains from Earlier Epidemics**
I. TAMM, E. D. KILBOURNE, and F. L. HORSFALL. *Proceedings of the Society for Experimental Biology and Medicine* [*Proc. Soc. exp. Biol., N.Y.*] **75**, 89–92, Oct., 1950. 18 refs.

Strain Lee, isolated in 1940 after several mouse-lung passages, is usually taken as the "classical" strain of influenza virus type B. The authors have collected several new B strains from the epidemics of 1945, 1947, and 1950, and compared behaviour with that of strain Lee in agglutination-inhibition tests and cross-neutralization *in ovo*. They found as wide antigenic variation within the type-B strains as within type A.

In all, 9 egg-adapted strains were compared with both Lee and PR8. Immune sera were obtained from hamsters and rabbits by injection of dilute allantoic fluid. Particular care was taken to eliminate interference by non-specific inhibitors; hamster sera were heated at 56° C. for 30 minutes only, but rabbit and ferret sera were heated at 65° C. for 30 minutes, mixed with an equal volume of PR8-infected allantoic fluid, incubated at 42° C. for 3 hours, and finally heated to 65° C. to destroy the virus. From the results of cross-agglutination inhibition tests it was evident that all strains differed significantly from Lee. Little variation could be shown within either the 1947 or 1950 strains, but clear indication was obtained of antigenic differences between strains from these 2 years and 1945. Cross-neutralization tests *in ovo* showed that the antigenic relation between Lee and a typical 1950 strain was not more than 6 to 12%.

It appears, therefore, that there is a more or less continuous spectrum of antigenic differences in strains of influenza B, as in type A, although it is not yet clear that these differences are sufficient to justify the abandonment of Lee as the standard vaccine strain for human immunization. *J. F. McCrea*

2370. **Acute Experimental Toxoplasmosis Treated with Aureomycin.** [In English]
E. STEEN. *Acta Pathologica et Microbiologica Scandinavica* [*Acta path. microbiol. scand.*] **27**, 844–850, 1950. 14 refs.

A standard suspension of the R.H. strain of *Toxoplasma gondi* was injected intraperitoneally into white mice of 20 g. weight. The standard suspension consisted of a 1 in 1,000 saline solution of peritoneal exudate of infected white mice, with the addition of 1,000 units of penicillin and of 100 μg. of streptomycin per ml. to prevent bacterial contamination.

Seven groups of mice infected in this way were given 0·1 mg. aureomycin intramuscularly 4 times daily for 12 days. Treatment was started 2 hours before, and 2 hours and 1, 2, 3, and 5 days after, infection. All mice in the first 2 groups survived; 55% of the animals in the third group survived also, but all mice in the other four groups and the control group died. This result leads the author to the conclusion that in human toxoplasmosis aureomycin is probably of little clinical value, as symptoms usually appear late in the acute infection.

The ground-up internal organs of half of the surviving treated mice were injected into fresh mice and proved to be still infectious, thus demonstrating that aureomycin treatment induced only a carrier state. The other half of the surviving mice were immune to reinfection with the same strain of *Toxoplasma*. *K. Zinnemann*

2371. **Nile Blue A as an Agent Suppressing Concomitant Bacterial Growth in Gonococcal Cultures.** (Nilblau A, ein Mittel zur Hemmung des Wachstums der Begleitbakterien bei der Kultur der Gonokokken)
H. SCHÜMMER and A. HUBBES. *Archiv für Dermatologie und Syphilis* [*Arch. Derm. Syph., Wien*] **192**, 61–64, 1950.

It was found that the comparatively high concentration of 0·5 mg. Nile blue A per 100 ml. serum agar did not harm gonococci, but was effective in suppressing contaminants. Nile blue B, on the other hand, was too toxic for gonococcal growth. *G. W. Csonka*

2372. **Sporulation and Viability of *B. anthracis* in Relation to Environmental Temperature and Humidity**
F. C. MINETT. *Journal of Comparative Pathology and Therapeutics* [*J. comp. Path.*] **60**, 161–176, July, 1950. 19 refs.

Anthrax bacilli in animal tissues or exudates do not readily form spores when the external temperature is below 70° F. (20·5° C.), but at temperatures between 90° to 98° F. (32·5° to 36·4° C.) sporulation takes place fairly quickly and may begin within 8 hours in open wounds on an exposed carcass or in exudates from infected animals. At temperatures between 60° and 70° F. (16° to 20·5° C.) there is a tendency for contaminants to overgrow anthrax bacilli, which may disintegrate, but if contamination does not occur there may be late production of spores. In tissues like the bone marrow and in skin of carcasses of animals dead of anthrax, according to the temperature, the bacilli may survive for relatively long periods. The author records survival in bone marrow for one week with air temperatures of 64° to 74° F. (17·5° to 23·5° C.) but other workers have noted longer survival periods.

The survival of the bacilli in dry sterile soil is remarkable, and the author records a period of more than 634 days with storage in dry air at room temperature. In damp or wet soil the survival times are considerably less, but sterilized soil of either type induces a longer life. Under favourable conditions of temperature and moisture sporulation may take place in this medium. The long survival of anthrax spores in damp soil, saturated

soil, or even water is well known and further evidence is brought forward in respect of the viability of spores in sterilized water as opposed to otherwise contaminated water, especially at temperatures below 60° F. (16° C.).

H. J. Bensted

2373. **Distribution of Haemolysins in Pathogenic and Non-pathogenic Staphylococci**

S. D. Elek and E. Levy. *Journal of Pathology and Bacteriology* [*J. Path. Bact.*] **62**, 541–554, Oct., 1950. 18 figs., 26 refs.

A total of 359 strains of staphylococci were examined for production of haemolysin by a plate technique. Each strain was cultured as a streak at right angles to a strip of filter paper soaked in staphylococcal antitoxin on two agar plates, one containing sheep erythrocytes and the other rabbit erythrocytes; α-, β-, and δ-lysins were identified by the type of haemolysis, the species of animal erythrocyte affected, and the presence and degree of neutralization by antitoxin. Most strains produced more than one type of lysin and these could be recognized by the pattern on the plates.

All 200 coagulase-positive strains isolated from human lesions produced a haemolysin. More than 82% produced α- and δ-lysins; another 11% formed β-lysin in addition to these two: 4% formed δ-lysin only and there was thus no absolute correlation between production of α-lysin and pathogenicity. Of 59 strains from animals, strains forming α-, β-, and δ-lysins were commonest (59%). Strains of the βδ type were next commonest, whereas only 10% were of the αδ type. Of 100 strains isolated from the human nose and skin, 23 were coagulase-positive and had the same pattern of haemolysins as the pathogenic strains. The other 77 strains were coagulase-negative; although none of them formed α-, β-, or δ-lysins, 95% produced a haemolysin which was not inhibited by antitoxin. This lysin was termed ε-lysin.

It is suggested that δ-lysin is identical with the α_2- and γ-lysins previously described. *D. G. ff. Edward*

2374. **Staphylococcal δ-Haemolysin**

J. Marks and A. C. T. Vaughan. *Journal of Pathology and Bacteriology* [*J. Path. Bact.*] **62**, 597–615, Oct., 1950. 11 refs.

[This paper, which contains a great deal of information concerning the properties not only of the staphylococcal δ-lysin, but also of the α- and β-toxins, should be read in the original by those interested.]

The existence of a δ-lysin was confirmed. Both δ-lysin and α-toxin produced haemolysis on agar plates containing washed sheep erythrocytes. Haemolysis due to α-toxin was not completely prevented by α-antitoxin, but this was not necessarily due to contamination of the α-toxin with δ-lysin. β-Toxin produced a discoloration of sheep erythrocytes; affected cells, after incubation at 37° C., underwent lysis when cooled to room temperature. A synergistic action between β-toxin and δ-lysin was demonstrated. Rabbit erythrocytes were lysed by α-toxin and δ-lysin, but not by β-toxin. Human and horse erythrocytes were lysed by δ-lysin, but not by α- or β-toxins.

Coagulase-positive staphylococci from lesions produced significantly more δ-lysin and α-toxin than did coagulase-positive staphylococci from carriers. There was a positive correlation between the amounts of δ-lysin and α-toxin produced by individual strains. Less δ-lysin was produced by coagulase-negative staphylococci, and none of these strains formed α-toxin. Use was made of the solubility of δ-lysin in ethyl alcohol and its insolubility in ether to prepare purified preparations from suspensions of organisms grown on "cellophane". The purified δ-lysin produced lesions when injected intradermally in man, rabbits, and guinea-pigs, its toxicity being rather less than that of α-toxin. Its lytic activity was neutralized in both the albumin and globulin fractions of normal serum. *D. G. ff. Edward*

2375. **Small Colony Variants ("G" Forms) Produced by *Staph. pyogenes* during the Development of Resistance to Streptomycin**

R. G. H. Barbour. *Australian Journal of Experimental Biology and Medical Science* [*Aust. J. exp. Biol. med. Sci.*] **28**, 411–414, July, 1950. 7 refs.

Small colony variants of the "G" type were produced by five strains of *Staphylococcus pyogenes* when exposed to low concentrations of streptomycin. The variant colonies were uniformly pin-point in size, unpigmented, and non-haemolytic. Morphologically, the cells were similar to those of the parent strains.

One of the variants was studied in detail. It was found to resemble the parent strain in respect of its ability to coagulate plasma and in its phage-reactions. The rate of metabolism of the variant was slower than that of the parent as judged by a slower growth rate, slower production of bacteriophage, and slower fermentation of glucose, lactose, and maltose. It failed to grow in the presence of mannitol. The variant remained stable and retained its resistance to streptomycin after several sub-cultures in the absence of the antibiotic.

G. B. Forbes

2376. **The Development of Resistance to Streptomycin by *Staphylococcus pyogenes***

R. G. H. Barbour. *Australian Journal of Experimental Biology and Medical Science* [*Aust. J. exp. Biol. med. Sci.*] **28**, 415–420, July, 1950. 1 fig., 6 refs.

A study is described of 5 strains of *Staphylococcus pyogenes* made resistant to streptomycin *in vitro* by repeated subculture in broth containing increasing concentrations of the antibiotic: 2 strains were initially sensitive and these developed resistance by small increments until a threshold of 0·1 g. per ml. was reached; thereafter a high degree of resistance was rapidly acquired: 3 strains were initially resistant to 0·2, 0·5, and 1·0 mg. per ml. respectively, and these developed increased tolerance at an extremely rapid rate. All 5 strains retained their resistance over a period of 6 months despite frequent transfer to streptomycin-free media. The parent strains and their resistant variants were identical in morphology and metabolic properties.

Streptomycin-resistant staphylococci were isolated from 17 patients with infected wounds or burns: 9

patients had received streptomycin by injection or topical application; the remaining 8 had not received the drug and it was believed that the infecting strains had gained access to the open lesions through cross-infection. Strains resistant *in vivo* resembled strains which had acquired tolerance *in vitro*. In particular were they alike in morphology, cultural characters, rate of acquisition of resistance, and inability to form streptomycin-inactivating enzyme.

G. B. Forbes

2377. **The Selective Demonstration of the Tubercle Bacillus by Fluorescence Microscopy. Part I.** (Die fluoreszenzmikroskopische Selektivdarstellung des Tuberkelbazillus)
E. JENSEN and G. GOHDE. *Tuberkulosearzt* [*Tuberkulosearzt*] **4**, 703–708, Dec., 1950. 8 refs.

2378. **The Relationship Between Serum Protein Fractions and Antibody Nitrogen Response in Diabetic Patients**
J. A. FLICK, S. C. KETTERER, M. G. WOHL, and S. O. WAIFE. *American Journal of the Medical Sciences* [*Amer. J. med. Sci.*] **221**, 71–76, Jan., 1951. 2 figs., 17 refs.

2379. **Studies of Immunological Reactions of Patients with Hodgkin's Disease: the Tuberculin Reaction**
A. ROTTINO and G. T. HOFFMANN. *American Journal of the Medical Sciences* [*Amer. J. med. Sci.*] **220**, 662–664, Dec., 1950. 7 refs.

Of 57 cases of Hodgkin's disease the tuberculin reaction was positive in 11, whereas of 248 healthy individuals serving as controls 91 reacted positively. None of the patients with the negative reaction ever regained his allergy, even during remissions induced by *x*-ray or nitrogen-mustard therapy. The authors postulate a change of the allergic state in Hodgkin's disease.

C. Gardikas

2380. **Immunization of Mice with Ultra-violet Killed Tuberculosis Vaccines**
A. MILZER, S. O. LEVINSON, and M. B. LEWIS. *Proceedings of the Society for Experimental Biology and Medicine* [*Proc. Soc. exp. Biol., N.Y.*] **75**, 733–736, Dec., 1950. 13 refs.

A vaccine was made from the H37 Rv strain of *Mycobacterium tuberculosis* by harvesting the growth on Petragnani's medium after 14 days' incubation at 37° C. A suspension in distilled water was ground for 30 minutes in a ball mill, and after coarse filtration was irradiated with ultraviolet light in an Oppenheimer–Levinson apparatus. Sterility tests with 10 to 20% of each batch of vaccine were made in a variety of media, incubation being prolonged for 6 months. Safety tests on each batch were made by injecting 5 ml. of undiluted vaccine intraperitoneally into 3 guinea-pigs and 0·5 ml. intraperitoneally and subcutaneously into 10 mice. The immunizing power of the vaccine for line-1 dba mice was compared with that of the B.C.G. vaccine from the Tice Laboratory, Chicago, by four subcutaneous injections at weekly intervals, followed 30 days later by a challenge inoculation of the strain H37 Rv. A slightly better protection was afforded by the irradiated vaccine even after it had been stored at 4° C. for periods of 1 to 12 months.

[No details are given of the results of the sterility tests, nor of the safety tests in animals. No idea can, therefore, be gained of the reliability of ultraviolet irradiation in effecting sterilization of the vaccine, nor can any comparison be made of the local reactions it may produce.]

J. E. M. Whitehead

2381. **Neutralization of Columbia-SK and Yale-SK Virus by Polio-convalescent and Normal Human Sera**
C. W. JUNGEBLUT. *Archives of Pediatrics* [*Arch. Pediat.*] **67**, 519–530, Nov., 1950. 26 refs.

Neutralization of Columbia-SK and Yale-SK strains of poliomyelitis virus by sera obtained from patients within 2 to 3 weeks of onset of paralytic or non-paralytic poliomyelitis was compared with the neutralizing activities of normal human sera and gamma-globulin. The majority of convalescent sera were obtained at the Kenny Institute at Jersey City, 36 being collected from paralytic patients in 1948 and 91 from paralytic and non-paralytic cases in 1949. Equal volumes of undiluted sera were mixed with dilute (10^{-4} to 10^{-9} for Columbia-SK virus and 10^{-1} for Yale-SK virus), held at 37° C. for one hour and 0° C. overnight, and then injected into young Swiss albino mice. Sera neutralizing at least 100 LD50 of virus were considered positive. On this basis, 21% of convalescent sera were positive against Columbia-SK and 53% against Yale-SK, the figures for "normal" sera being 16 and 71% respectively: 5 of 20 sera from healthy pregnant women were positive against Columbia-SK virus. A single batch of "normal" human gamma-globulin was capable at high dilution of neutralizing both virus strains.

J. F. McCrea

2382. **The Placental Transmission of Antibodies and Serum γ Globulins**
S. G. COHEN. *Journal of Infectious Diseases* [*J. infect. Dis.*] **57**, 291–298, Nov.–Dec., 1950. 20 refs.

Pregnant rabbits, near term, were injected intravenously with either human or bovine γ-globulin. At times varying between 1 and 120 hours after inoculation the amount of heterologous γ-globulin was titrated in the maternal blood, and also in the blood of the foetus, delivered by Caesarean section. In the maternal blood there was a rapid fall in titre between 1 and 4 hours, followed by a more gradual decrease. The foreign globulin was first detected in the foetal blood after 10 hours, but the titre did not reach that in the maternal blood until 120 hours afterwards. There were no significant differences in the findings between the series of rabbits injected with human γ-globulin and the series injected with bovine γ-globulin.

These results were contrasted with those obtained when pregnant rabbits were similarly injected with homologous antisera, the sera of rabbits immunized against either human or bovine γ-globulin. The antibody was detected in the foetal blood after 1 hour, and after 4 hours the level of antibody was the same in both maternal and foetal blood.

D. G. ff. Edward

Paediatrics

2383. **The Clinical Importance of Cold Agglutinins in Children.** (Klinický význam chladových aglutininů u dětí)
J. REJLEK. *Pediatrické Listy* [*Pediat. Listy*] **5**, 252–259, Sept.–Oct., 1950. 1 fig., 19 refs.

The cold agglutinin titre was ascertained in 263 patients, aged 1 to 12 years, suffering from various diseases (323 investigations). A value of 1 in 16 was taken as the upper limit of normal. In non-infective conditions (39 cases) a normal or low titre (1 in 4 to 1 in 16) was generally observed, whereas in acute infections, like bronchopneumonia (97 cases), rheumatic fever, and primary pulmonary tuberculosis, the titre showed a moderate rise (1 in 32 to 1 in 64). Highest values (up to 1 in 1,024) were observed in atypical pneumonia (31 cases). A titre of 1 in 32 ascertained in 64·5% of these cases was considered of diagnostic significance. There was a close correlation between the level of the titre and the degree of severity of the disease. However, the fluctuations during the course of the disease were prognostically of greater importance than the actual values at the onset. A quick rise in titre indicated a high state of immunity, a slow rise a protracted and severe course. Erythrocyte sedimentation rate and leucocyte count did not bear any relation to the agglutinin level.

The values found in infants (17) were similar to those in older children. In most patients the titre was between 1 in 4 and 1 in 32. Highest values were detected in a case of congenital heart disease with bronchopneumonia (1 in 64) and in 2 cases of atypical pneumonia (1 in 128).

The method of investigation is described in detail. It is accepted that the rise in the cold agglutinin titre during infections indicates an increased reactivity of the reticulo-endothelial system. The practical and prognostic value of these investigations is regarded as limited. *M. Dynski-Klein*

2384. **Methaemoglobinaemia resulting from Poisoning in Children**
W. B. MACDONALD. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 145–147, Jan. 27, 1951. 9 refs.

Methaemoglobinaemia (methaemoglobincythemia) is caused by a number of substances, amongst them some common household goods such as furniture polish, marking ink, dyes, and crayons, particularly red, orange, green, and violet. Well-water containing nitrates, which may be converted into nitrites in the intestine, has also been responsible. This form of poisoning was the third most common type treated at Melbourne Children's Hospital in 3 years (8 cases without a fatality, all in children under 3 years old). In 6 cases the cause of the poisoning was known: 3 children were critically ill when admitted, 2 children were intensely cyanosed with early circulatory failure, but were not unconscious or dyspnoeic; 3 children were intensely cyanosed but were otherwise unaffected. Two patients were treated expectantly and recovered rapidly. The remainder were treated with methylene blue with rapid recovery. The usual dosage is 2 mg. per kg. of body weight for infants, and 1·5 mg. for older children, and this dosage was adhered to approximately. The author gave a 0·4% aqueous solution intravenously, since this was available; a 1% solution is usually recommended. In severe cases methylene blue was given at once, before washing out the stomach, though in milder cases it appears safe to give the wash-out first. Oxygen was usually given, although the author points out that it can do no good. Clinical improvement was dramatic, colour and circulation improving in 5 to 10 minutes. Replacement transfusion was performed in 2 cases, but improvement was so rapid that the methylene blue was held responsible.

The condition can almost always be diagnosed from the history of ingestion of a toxic substance and the onset of cyanosis within an hour or two. The appearance varies from an intense grey cyanosis without symptoms to a similar cyanosis with signs of circulatory failure and dyspnoea. The blood, if examined at once, is of a typical chocolate colour. The spectroscope may reveal methaemoglobin [methaemalbumin?] or sulphaemoglobin. If blood specimens have to be kept they should be put at once into a refrigerator after oxalating and covering with oil.

The author feels that methylene blue is a safe and effective antidote which should be given straight away if the condition is suspected. *J. G. Jamieson*

2385. **Meat in the Diet of Premature Infants**
T. R. C. SISSON, A. F. EMMEL, and L. J. FILER. *Pediatrics* [*Pediatrics*] **7**, 89–109, Jan., 1951. 7 figs., 25 refs.

The effect of diets containing meat was studied in premature infants, 18 male and 1 female, whose ages at the time of study ranged from 12 to 50 days; the experimental work was usually started when the infant weighed between 1,700 and 2,000 g., was in good health, and had been gaining weight steadily for several days on the customary milk diet for premature infants. Each study-period comprised a fore-period of not less than 2 days on the experimental diet, followed by a further period of 3 to 5 days during which urine and faeces were collected. The diets used were: (1) cow's milk formula, as control study; (2) milk-and-meat, the meat being added in sufficient quantity to provide one-third of the dietary protein; (3) all-meat diet, supplemented with olive oil, calcium gluconate, sodium phosphate, and potassium acid phosphate. Commercial preparations of strained and cooked meats, including veal, pork, lamb, beef, calf heart, and liver, were used; a single variety of

meat, chosen at random, was used for each infant. The three diets were isocaloric and contained the same proportions of protein and fat; the caloric intake was calculated as approximately 130 to 140 Calories per kg. of body weight, with 16 to 17% of the calories from protein and 20 to 23% from fat; vitamins A, C, and D were given with all diets. In most cases a study of the meat-containing diet alternated with a study of the milk diet, so that those infants also acted as their own controls. Balance studies of nitrogen (17 infants), fat (16 infants), and calcium, phosphorus, and iron (17 infants) were carried out.

The results indicated that the meat protein was retained as well as, or almost as well as, the milk protein, as shown by the positive nitrogen balance and also by clinical records of weight and growth; in general, the meat protein was a little less well absorbed, but this was partly compensated for by better utilization of what was absorbed, and the resulting nitrogen balances were within a close range. The absorption of fat was not significantly altered when the milk fat in the diet was partly replaced by meat fat or wholly replaced by meat fat and olive oil; the retention of fat on all diets varied between 55% and 70% of fat intake. The retention of calcium was rather low in the milk periods and still lower in the milk-and-meat periods, but excellent retention of calcium was obtained on the all-meat diet supplemented with minerals (such supplementation being clearly a necessary measure when meat replaces milk in the diet). The retention of phosphorus was low both on the milk diet and on the meat-containing diets, although intake was adequate and approximately equal on all diets; but retention of calcium and phosphorus was higher than that reported for premature infants fed on human milk. The retention of iron was roughly proportional to the amount ingested, with iron balance negative or slightly positive on the control milk diet, and definitely positive on the meat-containing diets, showing that the iron of the strained meats was readily absorbed.

Joseph Parness

2386. **Digestion of Protein by Premature Infants, as Indicated by Nitrogen Absorption from Whole vs. Hydrolyzed Protein**

M. S. FEINSTEIN and C. A. SMITH. *Pediatrics* [*Pediatrics*] 7, 19–23, Jan., 1950. 8 refs.

Some difference exists in the current views concerning the ability of premature infants to digest protein efficiently. In the present investigation 5 premature infants, aged between 13 and 28 days at the start of the study, were observed for periods varying from 2½ to 6 weeks. The infants were fed on a basic formula of cow's milk mixture to which either casein or casein hydrolysate was added in amounts calculated to provide equal amounts of supplementary nitrogen; the diets were arranged in rotating 7-day periods. The supplementary casein or casein hydrolysate furnished from 33 to 46% of the nitrogen intake. Diet and faeces were analysed for nitrogen by standard techniques and the absorption of nitrogen was determined; nitrogen retention was not determined.

The results showed a high degree of nitrogen absorption from both types of feeding; with either supplement the absorption of nitrogen was from 86 to 94% of the dietary nitrogen, but neither resulted in consistently higher nitrogen absorption or weight gain than a normal diet. The inference is that the protein added as casein was digested efficiently, or, at any rate, efficiently enough for absorption and utilization. *Joseph Parness*

2387. **The Use of Vitamin B_{12} in the Treatment of Chronic Disturbances of Nutrition in Infancy.** (Sull'impiego della vitamina B_{12} nelle turbe croniche della nutrizione della prima infanzia)

L. SALMI. *Clinica Pediatrica* [*Clin. pediat., Bologna*] 32, 617–627, Nov., 1950. 5 figs., 18 refs.

The effect of vitamin B_{12} on haematopoiesis has caused its other functions to be neglected, functions such as its stimulation of growth of certain bacteria and the improvement in nutrition and rate of growth of laboratory animals. In 1946 Cary and others demonstrated that a synthetic diet containing all the known essentials still seemed to lack a growth factor which they called X. More recent work has suggested that this factor might be vitamin B_{12}. Dramatic results were reported by Wetzel and others following the administration of vitamin B_{12} to infants who were failing to grow and thrive. The author treated 5 infants, mostly about 3 months old, admitted to hospital with a history of failure to thrive, loss of weight, occasional loose stools, and an inadequate diet. Clinically there were oedema, debility, anaemia, hypoproteinaemia, hyposiderosis, and a high blood amino-acid level. These children were unlike some debilitated infants in that they thrived at first and then failed to progress or relapsed. On administration of vitamin B_{12}, however, a general improvement set in. Their weight rose steadily and continued to do so after the vitamin was withheld. The blood picture became normal and the amino-acid level fell while the serum iron and protein levels rose. The usual dose given was 7 μg. daily or every other day, parenterally, with a total dose of 70 to 226 μg. There were no harmful reactions.

The author points out that similar cases have not responded to vitamin B_{12}, and doubt has been cast on its value. It is presumably possible for a hypovitaminosis to occur, particularly where there has been a low casein intake, or faulty absorption because of gastrointestinal disturbance. Casein is normally the chief source of the vitamin. *J. G. Jamieson*

2388. **Potassium and Calcium Balance in Infants during the Treatment of Severe Diarrhoea with Dehydration.** (Hladiny kalcia u kojenců při léčbě těžkého průjmu s dehydratací)

E. POLÁČEK and J. HOMOLKA. *Pediatrické Listy* [*Pediat. Listy*] 5, 321–322, Nov.–Dec., 1950. 11 refs.

The successful treatment of dehydration largely depends on the appropriate composition of the hydrating fluid. The employment of hydrating fluids with a high potassium content in treatment demands close observation of the blood calcium values. The serum calcium and potassium levels were investigated during the various

phases of severe dehydration in infants. The flame photometer method of Homolka–Krupička was used to ascertain the former and the Kramer–Tisdall method for the latter. Levels of 18 to 22 mg. of potassium per 100 ml. and of 9 to 11 mg. calcium per 100 ml. were accepted as normal, the optimum ratio being 2 : 1.

Marked fluctuations were noted in the potassium level, which reached a concentration of over 26 mg. per 100 ml. in untreated cases. With parenteral administration of sodium chloride and glucose the level fell 11 to 16 mg. per 100 ml. It was restored to normal on the first day of parenteral administration of fluids containing potassium chloride, sodium chloride, and lactate, but dropped again to the previous low level between the 2nd and 4th days of treatment. With the help of Darrow–Butler solution introduced between the 5th and 17th days of treatment, and with clinical recovery, the concentration became normal. The calcium level generally remained within normal limits even during prolonged treatment with Darrow–Butler solution containing no calcium. [The figures, indicating only the total calcium level, should be treated with some reserve, as the value for ionized calcium may be much reduced in states of dehydration.] A fall in calcium level was found only in cases of dehydration combined with renal deficiency and in the " post-acidotic state " (Rapoport *et al.*, *Amer. J. Dis. Child.*, 1947, **73**, 682) after administration of fluids containing sodium chloride, sodium bicarbonate, and glucose.

The administration of calcium seems contraindicated in the restoration or maintenance of normal hydration in uncomplicated cases. *M. Dynski-Klein*

2389. **Uniovular Twins Showing Growth Disparity due to Renal Dwarfism**
M. D. MILNE. *Lancet* [*Lancet*] **1**, 204–207, Jan. 27, 1951. 3 figs., 19 refs.

2390. **Spina Bifida and Hydrocephalus (Arnold–Chiari Syndrome).** (Spina bifida et hydrocéphalie (Le syndrome d'Arnold Chiari))
M. PASQUIÉ. *Presse Médicale* [*Pr. méd.*] **59**, 50–53, Jan. 17, 1951. Bibliography.

The relation between spina bifida and hydrocephalus has not yet been fully clarified. The author reports 4 fatal cases of spina bifida with meningomyelocele accompanied by hydrocephalus; 3 of the patients died soon after operation for repair of the meningomyelocele, and the 4th of an intercurrent illness. In 3 of these cases the Arnold–Chiari malformation was found at necropsy. Reviewing the literature, the author accepts the view that the Arnold–Chiari malformation is secondary to fixation of the spinal cord in the lumbar region during foetal development, and that the cerebral lesions are secondary to the resulting hydrocephalus. The argument is rejected that closure of the meningomyelocele necessarily increases the degree of hydrocephalus; on the contrary, this procedure is advocated as the treatment of choice, to be carried out, accompanied by decompression of the atlanto-occipital region, during the first few days of life. *H. McC. Giles*

2391. **Dysostosis Multiplex (Gargoylism) with Maldevelopment of the Membrane of Bowman.** (Beitrag zur Frage der Dysostosis multiplex (Pfaundler–Hurler) mit Fehlbildung der Bowmanschen Membran)
F. WAGNER. *Zeitschrift für Kinderheilkunde* [*Z. Kinderheilk.*] **69**, 179–190, 1951. 10 figs., 26 refs.

The author describes in detail a case of gargoylism in a boy, and reviews the literature of this rare disease. When the patient first came under observation at the age of 3 months, few of the characteristic symptoms had developed, and the bone changes then found might well have been rachitic. Later all the usual symptoms developed until, at the age of about one year, the child showed the full picture of gargoylism, including corneal opacities. Rise in intra-ocular pressure was found on only one occasion. The child died at the age of 2 years after a herniotomy, and necropsy confirmed the clinical findings. Histologically there was an almost complete absence of the membrane of Bowman.
Marianna Clark

2392. **A Further Study of the Teeth of 5-year-old Children in Residential Homes and Day Schools**
M. MELLANBY and H. MELLANBY. *British Medical Journal* [*Brit. med. J.*] **1**, 51–57, Jan. 13, 1951. 17 refs.

In continuation of an extensive study which has been in progress since 1929, this paper records the results of the examination, in 1950, of the teeth of 542 children, aged 5 years, living in residential institutions, and of 560 children of the same age attending private day schools in or near London. The findings in these two groups are compared with each other and with those in similar groups examined in 1945 and 1949. The institutionalized children had, on the average, poorer tooth structure than the private-school children, though the difference was less marked than it had been in former years. The incidence of caries was 7·2% in the institutionalized children (10·5% in 1945) and 12·7% in the private-school children (14·2% in 1945). The conclusion was reached that the institutionalized children received a better diet, which more than made up for the increased susceptibility to caries to which they were prone from their poorer tooth structure. A high proportion (33%) of institutionalized children showed brown or black staining of the teeth, but this did not seem to be related to susceptibility to caries. *D. Gairdner*

2393. **The Fallacy in the Diagnosis of Microcolon in the Newborn**
C. M. LEE and B. G. MACMILLAN. *Radiology* [*Radiology*] **55**, 807–813, Dec., 1950. 2 figs., 42 refs.

The authors show that, judging by the views expressed in the literature, microcolon has been regarded as an anomaly of development which is not amenable to surgical correction. Descriptions of this condition indicate that the colon, although very small in calibre, has all the normal constituents in its wall. It does not, however, contain meconium. They consider that there is a widespread misinterpretation of cause and effect and quote cases to show that the non-enlargement of the colon is secondary to an obstructive lesion higher in the

bowel. The causes of the latter may be various; true local atresia of a small part of the small or large gut and meconium ileus, possibly secondary to pancreatic disease, are two types given.

A case is described in which an atresia of the transverse colon was treated surgically at 3 days old and the infant survived. Microcolon was present, but the bowel subsequently developed normally.

The authors failed to find evidence in the literature that true primary congenital microcolon exists, and suggest that if the symptomatic significance of this finding were realized, many more infants with urgent signs of bowel obstruction shortly after birth might be successfully treated. *A. M. Rackow*

2394. **Treatment of Gastro-enteritis in Infants with "Chloromycetin"**
D. C. FISON. *Medical Journal of Australia*. [*Med. J. Aust.*] **2**, 957–959, Dec. 30, 1950. 4 refs.

This paper records the treatment of 21 cases of infantile gastro-enteritis in Brisbane Children's Hospital with chloramphenicol. In 10 of the cases salmonellae were the cause; in 2 salmonellae and *Shigella sonnei*; in 5 *Sh. sonnei* alone; and in 2 *Sh. flexneri*. In 2 cases no pathogenic organism was found. In 3 months before the use of chloramphenicol was adopted for all severe cases of gastro-enteritis there were 11 deaths from this disease in the hospital. Treatment at that time included sulphonamides, penicillin, streptomycin, antidysenteric sera, and non-specific supportive measures (which were, in fact, regarded as the most important). With routine use of chloramphenicol there were no further deaths, despite the advance of summer and a mounting total of cases. The optimum dose was thought to be 100 mg. per kg. of body weight daily for 10 days, given in divided doses dissolved in the feeds. In a few cases the patient refused the medicated feed and then "gavage" was used. Despite the high cost of the drug the total expense per case was nearly halved owing to the shortened course of the disease. *T. A. H. Hunter*

2395. **Treatment of Pneumonias in Children with a Single Massive Dose of Sulfathiazole.** [In English]
C. FRIDERICHSEN and T. WALTHER. *Annales Paediatrici* [*Ann. paediatr., Basel*] **175**, 285–300, Oct., 1950. 1 fig., 18 refs.

The authors describe their experience of administering a single massive dose of sulphathiazole in the treatment of pneumonia in children. During the 8 years 1941–9 they treated 1,500 children, 875 of them with pneumonia (90 lobar, 785 bronchopneumonia) and 625 with febrile bronchitis, including capillary and asthmatic bronchitis. The present paper is concerned with the cases of pneumonia [but unfortunately no bacteriological studies are reported]. The dose of sulphathiazole was 0·3 g. per kg. body weight, with a maximum dose of 4 g. in children over the age of 2 years. The tablets were powdered, mixed with sugar or saccharine, and dissolved in 1 oz. (28·5 ml.) of water, milk, or fruit juice. Fluid was restricted during the first 4 hours to a little water, but after that the patient was allowed as much water as he wanted. If vomiting occurred immediately, the dose was repeated after about an hour; if there was no satisfactory response, a second dose was given in 24 hours and repeated if necessary.

In 16·5% of cases two or more doses were required, usually because of some complication. Penicillin became available during the last 3 years of the period and was given additionally in 39 cases, mainly in cases in which there were complications or the child was under one year of age. Temperature fell to normal within 2 days, but the pulse rate sometimes remained raised. Of side-reactions, macroscopical haematuria occurred only in one patient who had been treated earlier for nephritis; microscopical haematuria was observed in 23 cases. Vomiting occurred in the first hour in 4 cases, and at about 4 hours in 210, when the sulphonamide level in the blood was assumed to be about 10 mg. per 100 ml. Leucopenia developed for 2 to 5 days in 3 cases, but not agranulocytosis. The temperature rose again (drug fever) on the 3rd to 5th days in a quarter of the cases. A scarlatiniform, morbilliform, or urticarial rash was noted in 2·7% of cases.

The main complication was acute otitis media (24% of cases), but without mastoiditis or intracranial complication. In 4·1% of cases there was a new attack of pneumonia or a relapse. There were 6 cases of empyema (0·68%), 2 of them in newborn infants, one of whom also had a lung abscess; there was one other case of lung abscess, also in a newborn infant. Serous pleurisy occurred in 22 cases and serous meningitis, with recovery, in 9. The mortality was 4·9% (43 cases); 23 of these patients died within 24 hours of admission, and of the remaining 20, 16 had a congenital lesion, 8 had heart disease, and 9 had congenital debility.

[It is difficult to make comparisons, and the authors themselves seem to favour the use of penicillin in children in the first year of life. Their results certainly suggest that where sulphonamide treatment is selected (in older patients and in less serious cases) the single massive dose is safe and effective, and has obvious advantages over continuous treatment.] *A. W. Franklin*

2396. **An Unusual Case of Chylopneumothorax in an Infant.** (Su di un raro caso di pneumochilotorace nel lattante)
G. B. MATTEUCCI. *Archivio Italiano di Pediatria e Puericoltura* [*Arch. ital. Pediat.*] **14**, 205–220, 1950. 3 figs., bibliography.

After a brief review of the literature the author states that the case he describes is the 44th recorded case of chylothorax in a child under 16 years of age; it is the 3rd case of chylopneumothorax in a child and the first in an infant under one year. The case was that of a male admitted at the age of 4 months with a month's history of increasing dyspnoea, moderate cough, and slight fever. During the 24 hours before admission the child had 3 attacks of severe dyspnoea and cyanosis. On admission he was desperately ill and was found to have a left hydropneumothorax and enlarged liver and spleen: 70 ml. of milky fluid and 50 ml. of air under pressure were removed from the left chest. The fluid had a

specific gravity of 1016, a *p*H of 8·4, proteins 4·11 g. per 100 ml., fat 1·64 g. per 100 ml., cholesterol 200 mg. per 100 ml.; there were a few cells, consisting of 78% lymphocytes and 22% endothelial cells. Culture for tubercle bacilli and other organisms was negative and the fluid did not infect a guinea-pig. A radiograph confirmed the hydropneumothorax on the left and showed infiltration at the right apex. The Mantoux reaction was strongly positive and the child's father had recently had a tuberculous pleural effusion. In the first month in hospital 600 ml. of fluid was taken off in 9 paracenteses; the fluid gradually ceased to accumulate and the pneumothorax expanded. Streptomycin treatment was given for 4 months and the right-sided infiltration had cleared by the end of that time. The temperature became normal within a month. It is thought that tuberculous tissue had blocked the thoracic duct and ulcerated into it, and that the broncho-pleural fistula had originated in the same way. *John Crofton*

2397. **Malignant Lymphogranulomatosis in Childhood.** (Maligni lymfogranulomatosa v dětském věku)
J. JANELE. *Pediatrické Listy* [*Pediat. Listy*] **5**, 265–270, Sept.–Oct., 1950. 31 refs.

A report is presented on 17 cases of Hodgkin's disease observed during a period of 16 years. The average age of the patients on admission was 7½ years, the youngest being 4 years old. There was no congenital case in the series. Signs and symptoms of the disease persisted for a period of 2½ months to 10 years. The age of the child at the onset of the disease (youngest child 2 years, average age 5½ years) seemed to have no bearing on the severity of the condition. In 10 cases enlargement of the cervical lymph nodes was the first sign. In 9 cases this was associated with anorexia, pallor, and listlessness. The nodes on the left side were more often affected, probably due to easier propagation along the course of the thoracic duct. In 3 cases other groups of lymph nodes were primarily affected. Additionally, in 13 cases enlargement of the hilar lymph nodes was observed, leading to partial atelectasis, as a result of compression of the bronchus. The general condition of the patients was good in 9 and bad in 8 cases. Only 2 children were cachectic and suffered from generalized oedema. Ascites and cachexia developed in 4 other patients during their stay in hospital. The spleen was moderately enlarged in 7 of the patients, the liver in 11. In 12 cases the temperature showed a typical Pel–Ebstein curve, which remained unaltered by *x*-ray therapy or chloral-" kylamine " treatment. Erythrocyte sedimentation rate was high in the majority of the cases (30 to 100 mm. per hour), corresponding to the severity of the condition. The blood picture (175 investigations) was inconclusive. The erythrocyte count was little affected; the colour index dropped below 1·0 only in cases in which there was progressive deterioration. The leucocyte count ranged from 5,000 to 15,000 per c.mm. and rose with intercurrent infection up to 31,000 per c.mm.; the differential count showed a marked monocytosis (4 to 12%); lymphopenia (5 to 15% in severe cases) was aggravated by chloral-kylamine treatment. Eosinophilia was not an essential feature (usually below 4%, highest 15%, with an occasional rise to 28% after treatment).

The diagnostic value of bone-marrow puncture was limited; the aspiration of enlarged lymph nodes, especially in untreated cases, yielded more reliable results. Biopsy, however, was the method of choice. Typical Reed–Sternberg cells were found in 3 out of 5 aspirations as against 1 out of 5 bone-marrow smears. The *x*-ray investigation revealed only cortical affections. Of the 17 cases 15 were of the granulomatous type and 2 patients suffered from Hodgkin's paragranulomatosis. No case of Hodgkin's sarcoma was found. The results of *x*-ray therapy (6 cases) and of treatment with injections of chloral-kylamine (5 cases) were inconclusive.
M. Dynski-Klein

2398. **Erythrogenesis Imperfecta**
I. A. B. CATHIE. *Archives of Disease in Childhood* [*Arch. Dis. Childh.*] **25**, 313–324, Dec., 1950. 8 figs., 14 refs.

Refractory peripheral erythrocyte anaemia with normal leucocytes and platelets and scanty reticulocytes is described in 5 children aged from 3 to 12 weeks. Marrow erythrocytes were plentiful, though in 2 patients these later appeared to be approaching exhaustion. The facies showed a remarkable similarity; all the patients had tow-coloured hair, snub noses, thick upper lips, rather wide-set eyes, and an intelligent expression. No abnormal physical signs, except pallor, were noted. Erythrocyte fragility was normal; repeated direct and indirect Coombs's reactions and the Donath–Landsteiner reaction were negative, as were also attempts to demonstrate lysins by varying *p*H and temperature. Repeated blood transfusion was required, bringing with it the risk of siderosis. Splenectomy, performed in one case, was of doubtful value.

Culture of the marrow of 3 patients led to normal maturation from pro-erythroblast to fully haemoglobinized normoblast, but no further maturation to reticulocyte occurred. The addition of fresh normal plasma to the nutrient fluid did not affect the failure of reticulocytosis. This argues against a maturation-deficiency factor, as do the lack of response to haematinics and the failure of fresh-blood transfusions to induce a reticulocytosis. Two points in favour of there being a maturation-deficiency factor are that, so far as is known, the children were normal at birth, and that in no case was there a complete lack of reticulocytes.

The author prefers the term " erythrogenesis imperfecta " to the term " congenital hypoplastic anaemia " used by Blackfan and Diamond in their *Atlas of the Blood in Children*. *Harold Caplan*

2399. **Circulatory Diseases of the Kidneys in Infancy and Childhood**
W. W. ZUELZER, S. CHARLES, R. KURNETZ, W. A. NEWTON, and R. FALLON. *American Journal of Diseases of Children* [*Amer. J. Dis. Child.*] **81**, 1–46, Jan., 1951. 41 figs., 23 refs.

See also Section Pathology, Abstract 2345

Medicine: General

2400. **Energy Expended by Patients on the Bedpan and Bedside Commode**
J. G. BENTON, H. BROWN, and H. A. RUSK. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1443–1447, Dec. 23, 1950. 2 figs., 26 refs.

A comparison was made between the strain imposed on the cardiovascular and respiratory systems when the patient used a bed-pan and that imposed when he used a commode. The oxygen consumption, measured on a Benedict–Roth spirometer, of 13 male and 2 female patients with cardiac disease was compared with that of 12 male patients and one female patient without cardiac disease. Both groups simulated defaecation as closely as possible by " bearing down " or performing Valsalva manœuvres on both the bed-pan and the commode. These actions were performed approximately 2 hours after meals, a rest period of 15 minutes being allowed between the 2 procedures so that each patient served as his own control in the comparison. Each procedure was completed within 3 minutes, followed by a 3-minute recovery period. Resting oxygen consumption over a 6-minute period was calculated. The difference between these 2 readings was considered to be the excess oxygen consumption, and thus the energy cost of the particular action under study. Statistical analysis of the findings showed that the percentage mean excess oxygen consumption for the use of the bed-pan over the use of the commode in the group of patients with heart disease was 50·7 and in those without such disease 48·4, suggesting that the use of the bed-pan is physiologically an undesirable procedure from the standpoint of energy cost.
Kenneth Marsh

2401. **Occurrence of Convulsive Seizures during Treatment of Asthma with Cortisone Acetate**
F. C. LOWELL, W. FRANKLIN, H. D. BEALE, and I. W. SCHILLER. *New England Journal of Medicine* [*New Engl. J. Med.*] **244**, 49–52, Jan. 11, 1951. 4 refs.

The authors record the occurrence of epileptiform convulsions in a patient with chronic asthma under treatment with cortisone. Cortisone was administered intramuscularly in 50-mg. doses, 2 being given on the first day of treatment and 4 (50 mg. 6-hourly) on subsequent days. The asthma began to improve on the 4th day and from that time the patient remained free from respiratory symptoms. On the 11th day of treatment he complained of headache which persisted during the next day, when he had 4 epileptiform fits. No cortisone was given on that day, but 50 mg. was administered on the 13th day and 100 mg. subsequently without fits recurring. An electroencephalogram (EEG) taken 2 days after the fits showed some rhythmic slow activity with no focal abnormality. A month later, when the dose of cortisone was being gradually decreased and the patient was receiving 50 mg. daily, lid-lag and tremor of the hands were observed; these symptoms disappeared and the asthma recurred 3 weeks after cortisone was stopped. The EEG was normal 3 months later.

Epileptiform seizures have previously been described as occurring during adrenocorticotrophic hormone therapy but not during treatment with cortisone. The fits were attributed to cortisone because the patient had never previously had convulsions and there was no family history of epilepsy. During the 10 days before the fits occurred the patient had gained 5 lb. (2·26 kg.) in weight; the authors suggest that this was due to retention of salt and water and may have been responsible for the seizures. *R. S. Bruce Pearson*

2402. **Diatrin, a New Antihistaminic with Minimal Side Reactions**
S. MARTON. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1444–1449, Dec., 1950. 17 refs.

See also Sections Pharmacology and Therapeutics, Abstract 2249; and Pathology, Abstract 2323.

METABOLIC DISORDERS

2403. **A Case of Chronic Porphyria.** (Un caso de porfiria cronica)
X. VILANOVA, J. PIÑOL, and J. REIG. *Actas Dermo-Sifiliográficas* [*Actas dermo-sifiliogr., Madr.*] **42**, 17–24, Oct., 1950. 2 figs.

A man, aged 28, gave a 4-year history of recurrent vesicular eruptions on the exposed parts. In this time he had also had an attack of hepatitis and an attack of abdominal colic accompanied by urine pigmentation. The vesicular lesions, provoked by sunlight, were suggestive of those seen in epidermolysis bullosa, and milium-like cysts appeared in the scars remaining after healing. Abnormal quantities of porphyrins were found in the urine.

The syndrome generally follows an infective hepatic disease (syphilis, infective hepatitis) or a toxic hepatitis (alcohol) and may be considered as occupying a position somewhere between the acute porphyrias (nervous and digestive symptoms; excretion of porphobilinogen) and congenital porphyrias (cutaneous signs mainly; excretion of uroporphyrins and coproporphyrins). The cutaneous lesion is an eruption of epidermolysis bullosa type provoked by trauma, heat, and sunlight. Healing leaves pigmented scars and sometimes milia. Vesiculo-oedematous dermatitis of exposed parts is occasionally seen. The exposed parts become hyperpigmented to a brownish-red colour and hypertrichosis may become evident, especially in women (possibly reactions of defence). The cutaneous syndrome has been variously named hydroa tarda, vesicular or erosive pigmented

porphyria of adults, or bullosis actinica et mecanica. Digestive symptoms may be attacks of abdominal colic, seldom so severe as those occurring in the acute porphyrias. These may be followed by the appearance or accentuation of skin lesions. Mental and nervous symptoms similar to those seen in the acute disease may rarely occur. The most important point is the excretion of pathological quantities of porphyrins or of porphobilinogen (this may be intermittent).

James Marshall

2404. **Significance of Arterial Blood Sugar in Spontaneous Hypoglycemia**
M. FABRYKANT and B. I. ASHE. *American Journal of the Medical Sciences* [*Amer. J. med. Sci.*] **221**, 61–70, Jan., 1951. 3 figs., 30 refs.

The authors determined blood sugar levels in 10 patients suffering from idiopathic hypoglycaemia. In repeated estimations hypoglycaemic symptoms were not evident until after the 3rd hour in glucose tolerance tests, indicating that the test should be prolonged to 5 hours when hypoglycaemia is being investigated.

The authors also studied the relation between arterial and venous blood sugar levels during glucose tolerance tests and found that the arterial blood sugar level, as estimated on 0·1 ml. of capillary blood by micro-methods, was often lower than the venous blood sugar level and that this reversal of the usual relation often occurred at the time of onset of hypoglycaemic symptoms. They discuss the difficulty of explaining this finding, but, insisting that their figures are free from analytical error, suggest that there may be diffusion of glucose from the tissues into the venous blood.

[Simultaneous estimation of the blood sugar level by macro-methods on specimens obtained from arteries might have provided further evidence; as it is, one must remain sceptical of this alleged reversal of arterio-venous glucose differences.] *Richard Terry*

2405. **Essential Hyperlipemia**
E. R. MOVITT, B. GERSTL, F. SHERWOOD, and C. C. EPSTEIN. *Archives of Internal Medicine* [*Arch. intern. Med.*] **87**, 79–96, Jan., 1951. 2 figs., 19 refs.

Although hyperlipaemia, a high neutral-fat content of the serum, is found in many medical disorders (which are briefly listed here) and occurs post-prandially as a normal phenomenon, yet occasionally a persistent hyperlipaemia is encountered for which no explanation can be found. The authors report fully 3 typical cases of their own, all discovered accidentally when blood samples were taken. They also review 14 similar cases collected from the literature.

Abdominal pain is a common symptom and was a major feature in 7 cases. It is variable in type. Many abdominal disorders, including acute appendicitis, ulcer, acute pancreatitis, and other acute abdominal conditions, may be simulated. The authors consider essential hyperlipaemia should be listed among the conditions simulating the acute abdomen. A haemorrhagic tendency occasionally occurs. The liver was enlarged in 9 patients and the spleen also in 9. Characteristic xanthomatous lesions, varying widely in position, were found in 7 patients. They differ somewhat from the similar skin lesions of hypercholesteraemic xanthomatosis. Lipaemic retinitis was reported in 10 cases. Jaundice did not occur. Mild albuminuria or mild glycosuria may be present, but not frank diabetes. Leucocytes are usually normal in number, but abdominal crisis may cause a leucocytosis. Fasting blood sugar level and glucose tolerance are usually normal. Liver function also appears normal.

The serum is persistently milky or creamy. Total serum lipids are greatly increased, ranging from 1,800 to over 9,000 mg. per 100 ml. Neutral fats show greatest increase, but total cholesterol is usually much raised. Total phosphatide level is also high. Lipid levels remain high even on fat-free diet. The course is believed to be benign. Treatment with choline, lipocaic, insulin, or liver has proved of no avail. Family history is occasionally positive. A tendency to lipid deposition in the organs is generally considered slight, but in one of the three typical cases here reported a biopsy study showed liver cells full of fat. All 3 of these patients had splenomegaly and 2 had hepatomegaly.

The condition of essential hyperlipaemia should be borne in mind in every instance of abdominal pain of obscure origin. Unnecessary laparotomy may thereby be avoided. *C. L. Cope*

2406. **Disorders of Metabolism of the Aromatic Amino-acids.** (Les troubles du métabolisme des acides aminés aromatiques)
E. MARTIN, G. MILHAUD, and B. COURVOISIER. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **26**, 4893–4905, Dec. 25, 1950. 7 figs., bibliography.

2407. **Urinary Excretion of Amino-acids in a Patient Suffering from Scurvy.** (De uitscheiding van aminozuren in de urine bij een patient met scorbuut)
J. H. P. JONXIS and S. K. WADMAN. *Maandschrift voor Kindergeneeskunde* [*Maandschr. Kindergeneesk.*] **18**, 251–258, 1950. 11 refs.

An increased content of amino-acids in blood and urine was found in a case of scurvy. A disturbance in the decomposition of the aromatic amino-acids was considered to be the possible cause, because for this decomposition vitamin C is necessary. Vitamin C is probably also needed for the normal metabolism of various other amino-acids. Administration of vitamin C was followed by a fall in the amino-acid content of the blood; a few days later the urine content had also returned to normal. *S. J. de Jong* [*Excerpta Medica*]

2408. **Scorbutic Melanokeratosis.** (Über Melanokeratosis scorbutica)
W. EHRENGUT. *Annales Paediatrici* [*Ann. paediatr., Basel*] **175**, 413–433, Dec., 1950. 5 figs., 49 refs.

Hyperpigmentation and other symptoms occasionally observed in adults affected with scurvy were found in 2 infants, each 11 months old. In both infants there were the clinical signs of Moeller–Barlow disease in the skeleton, together with a marked pigmentation, hyper-

keratosis, and hypertrichosis of the skin of the face and a sharply defined pigmentation of the dorsum of the hands. Parts of the body not exposed to light showed no pathological changes. Under ascorbic acid treatment (250 mg. per day) the symptoms disappeared within 3 weeks and the bone lesions healed.

In Addison's disease and in some cases of thyrotoxicosis pigmentation of the skin can be reduced by administering vitamin C. This response points to the role of vitamin C in the genesis of pigmentation and indicates a functional relation between adrenal cortical hormones and vitamin C. Melanin, the principal skin pigment, is apparently formed by the action of dopa-oxydase on L-dioxyphenylalanine or on the chemically related compound tyrosine in the presence of copper. Sulphydryl groups present in the epidermis and ascorbic acid inhibit the process of melanin formation, and hyperpigmentation is facilitated by the low content of these substances in the skin in scurvy and Addison's disease. The interrelation of vitamin C and vitamin A is responsible for the appearance of hyperkeratosis in these cases. Combined vitamin-A and vitamin-C deficiency syndromes have been observed in animals and men. The author points to the similarity between the symptoms described by him and those of Riehl's melanosis, a condition due to inanition, produced by avitaminosis and adrenal cortex dysfunction. High copper levels were observed in the blood of 9 out of 10 patients suffering from Riehl's disease. Treatment with vitamin C and adrenal cortical extract is indicated.

M. Dynski-Klein

DIABETES

2409. **Types of Human Diabetes**
R. D. LAWRENCE. *British Medical Journal* [*Brit. med. J.*] **1**, 373–375, Feb. 24, 1951. 3 figs., 6 refs.

The author distinguishes between diabetics who are insulin-deficient and those who are not. For diabetes not due to insulin deficiency he has coined the words "lipoplethoric" diabetes and "lipoatrophic" diabetes. The lipoplethoric form occurs commonly in the obese, middle-aged, female patient with symptoms of thirst, polyuria, and pruritus, but without ketosis. Diet alone controls the diabetes in this type of case. The lipoatrophic form is extremely rare, and few cases have been recorded. There is severe wasting, progressing to a complete atrophy of depot fat. Hyperglycaemia and an intense lipaemia (4 to 8%) occur, again without ketosis. Large doses (1,600 to 2,000 units) of insulin are necessary for the control of the hyperglycaemia. Portal cirrhosis and enlarged spleen are usually present. The author suggests that there is a fault in some enzyme system concerned with the regulation or storage of fat in both lipoatrophic and lipoplethoric diabetics.

Insulin-deficient diabetes is characterized by ketosis accompanying the hyperglycaemia. All diabetic children and most adult diabetics under 40 belong to this group. The author admits that his hypotheses are the result of personal clinical observation and require experimental proof. Investigations are suggested into the insulin content of the pancreas in cases of each clinical type that estimations of blood insulin levels by Bornstein's method with hypophysectomized, adrenalectomized, alloxan-diabetic rats may further elucidate the different types of human diabetes. *I. McLean-Baird*

2410. **Later Status of Juvenile Diabetics**
C. W. DAESHNER, R. W. DEISHER, and A. F. HARTMANN. *Journal of Pediatrics* [*J. Pediat.*] **38**, 8–17, Jan., 1951. 6 refs.

The findings obtained from a follow-up at the St. Louis Children's Hospital of 120 patients who had diabetes before they were 15 years old are presented. There were 30 deaths in the series, chiefly from acidosis or pneumonia, and information about 30 patients was not available. The mean age of the remaining 60 patients was 22·5 years. Each patient was subjected to a careful investigation of nutritional progress, the incidence and severity of acidosis and hypoglycaemic reactions, and the occurrence of complications. An assessment of the degree of glycosuria was attempted. Renal function was assessed by serum non-protein nitrogen estimations, an Addis count, and urine concentration tests, a specific gravity of less than 1·026 being taken as evidence of impaired renal function. In all the cases blood pressure was measured, the retinae were examined under full mydriasis, and capillary fragility tests (by the method of Wright and Lilienfield) were carried out. The dorsalis pedis artery was carefully palpated for evidence of arteriosclerosis. The results were evaluated statistically, the perfect history of control or the perfect physical examination being given a "score" of 100%; a score of 80% was taken as the arbitrary dividing line between good and bad control of the diabetic state.

The incidence and severity of vascular complications were found to be directly related to the duration of the diabetes. Little difference was noted between those with well-controlled and those with badly-controlled diabetes in the first 7 years; later there was considerable difference in physical grading between the well-controlled and poorly-controlled groups. A similar relation was observed for individual complications, retinopathy occurring 3 times more frequently in a poorly-controlled group, and renal disease twice as commonly. The authors conclude that although good control of diabetes does not entirely prevent the onset of renal degenerative and vascular disease in diabetics, it minimizes their incidence and severity.

[This is an excellent long-term study with a careful statistical analysis which is not readily summarized. It provides further confirmation of the importance of adequate control in diabetes.] *I. McLean-Baird*

2411. **A Clinical Comparison of Modified Insulins**
J. L. IZZO, S. L. CRUMP, and W. KUNZ. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1514–1527, Nov., 1950. 5 figs., 43 refs.

The authors have compared the effect of 5 different types of insulin, and mixtures thereof, given once daily before breakfast with fixed diets, on the 24-hourly curve

of sugar levels in blood and urine of 19 female diabetic patients in hospital. The insulin preparations compared were: (1) 2 : 1 mixture of soluble insulin and protamine zinc insulin (P.Z.I.); (2) " NPC-40 "; (3) " NPH-50 "; [the difference between (2) and (3) is unexplained], (4) P.Z.I. alone; and (5) globin zinc insulin. Only preparations (4) and (5) gave distinctive results, P.Z.I. controlling sugar levels at night but not after meals, and globin zinc insulin causing a fall in the sugar levels in the afternoon but allowing relapse in the night. The authors divide their patients into two groups, namely, 7 stable cases and 12 unstable and variable from day to day.

[Full details are not given, but the first group seem to have been older and of the type who still probably have endogenous insulin sufficient to level out the inconsistencies which tend to occur in insulin-deficient patients dependent entirely on exogenous injections as in the second group.] *R. D. Lawrence*

2412. **Studies of the Liver in Diabetes Mellitus. I. Structural and Functional Abnormalities. II. The Significance of Fatty Metamorphosis and its Correlation with Insulin Sensitivity**

H. J. Zimmerman, F. G. MacMurray, H. Rappaport, and L. K. Alpert. *Journal of Laboratory and Clinical Medicine* [*J. Lab. clin. Med.*] **36**, 912–928, Dec., 1950. 4 figs., 77 refs.

Holding the view that the state of the liver in diabetes had been inadequately investigated, the authors carried out liver function tests and needle biopsy examination of the liver in 28 patients with uncomplicated, well-controlled diabetes. Biopsy specimens were taken by the Vim–Silverman technique through the midaxillary intercostal route, and liver function was assessed from the results of bromsulphalein excretion, thymol turbidity, and cephalin–cholesterol flocculation tests and from serum bilirubin determinations. There was no history of alcoholism or jaundice in any of the patients.

There were marked fatty changes in 5 of the cases, moderate in 7, and slight in 2. In general, the larger the liver the greater the fatty metamorphosis, although in 6 fatty livers there was no enlargement. Haemosiderosis was found in 8 fatty livers, but not in the normal livers, and the authors draw a parallel with the haemosiderosis seen in the fatty liver of malignant malnutrition. Vacuolization of the nuclei due to intranuclear glycogen was seen in 16 instances. No relation was found between the degree of fatty change and either the results of the liver function tests or the severity of the diabetes before treatment.

In the second paper the authors discuss the results of an investigation of the insulin sensitivity of their patients by Himsworth's glucose insulin tolerance test. Of their 12 patients with moderate or severe fatty changes, 11 were insulin-resistant. A higher incidence of fatty liver was found in the obese, in those aged over 30, and in those with long-standing diabetes. Contrary to the views of some other workers the authors believe that the fatty liver is not responsible for the insensitivity, because they have seen many examples of non-diabetic patients with fatty livers who were sensitive to insulin. They suggest that insulin insensitivity, fatty metamorphosis, and obesity are all due to pituitary over-activity.

[More biopsy examinations of each patient would have increased the value of this paper, for a single examination does not always reflect the general intensity of fatty metamorphosis.] *Richard Terry*

2413. **Raised Blood Pyruvic Acid Level in Diabetic Acidosis. The Value of Cocarboxylase in Treatment**

I. C. Gilliland and M. M. Martin. *British Medical Journal* [*Brit. med. J.*] **1**, 14–16, Jan. 6, 1951. 2 figs., 14 refs.

This paper from the British Postgraduate Medical School records an experimental and clinical assessment of the value of the co-enzyme co-carboxylase (aneurin diphosphate) in the treatment of diabetic acidosis. Series of rabbits with alloxan-induced diabetic precoma were used for comparison. In the control group treatment was commenced with 10 to 50 units of soluble insulin, the initial injection being given intravenously and subsequent injections subcutaneously at 2-hourly intervals. Intravenous normal saline was administered at the rate of 100 ml. 2-hourly for 4 hours. The second group of rabbits received identical treatment for the diabetic ketosis, but in addition 25 mg. co-carboxylase was given intravenously and 10 mg. riboflavin subcutaneously every 2 hours. No significant difference was observed in the rate of recovery from acidosis between the control group and the group treated with co-carboxylase and riboflavin. The pyruvic acid level was measured in blood taken by cardiac puncture; the level was high in diabetic precoma: it fell as treatment progressed, with no significant alteration in the rate of fall when co-carboxylase was added to the therapeutic measures in controls.

Four patients in diabetic acidosis (2 with severe acidosis and 2 with mild acidosis), were compared in a similar manner. The patients with severe acidosis received subcutaneously soluble insulin, 50 units 4-hourly, and the patients with mild acidosis received 20 units of soluble insulin 4-hourly, with saline as required. One of each pair was also given 200 mg. co-carboxylase intravenously and 10 mg. riboflavin subcutaneously every 2 hours. No difference was observed either clinically or in the measurements of the blood pyruvic acid level, blood sugar level, or alkali reserve when co-carboxylase and riboflavin were administered.

The authors are unable to confirm the claims of Markees and Meyer, who state that the administration of co-carboxylase and riboflavin hastens recovery. They point out, however, that the patients in this series were not comatose and suggest that the enzymes employed may hasten recovery from coma.

I. McLean-Baird

2414. **Arteriosclerosis and Serum Lipids in Diabetes Mellitus**

J. Pomeranze and H. G. Kunkel. *Angiology* [*Angiology*] **1**, 503–514, Dec., 1950. 6 figs., 42 refs.

See also Section Pathology, Abstract 2338.

Cardiovascular Disorders

2415. **Controlled Observations on the Effect of Low Sodium Dietotherapy in Essential Hypertension**
A. C. CORCORAN, R. D. TAYLOR, and I. H. PAGE. *Circulation* [*Circulation*] **3**, 1–16, Jan., 1951. 5 figs., 25 refs.

Considerable reduction in blood pressure and improvement in eye-ground changes occurred in 4 of the authors' 14 cases of severe essential hypertension when the daily sodium intake was kept below 0·5 g. In some cases these changes were not apparent until after 4 weeks on such a regimen. With a rice diet they obtained similar benefits, which they find to be due to the low sodium content of this diet. These beneficial results could be maintained in only 2 of the 4 patients. They found that low-sodium dietotherapy for out-patients was difficult and often quite impracticable. Adherence to the diet should be checked by frequent estimations of the urinary sodium content. *Albert Venner*

2416. **The Effect of the Rice–Fruit Diet on the Composition of the Body**
C. B. CHAPMAN, T. GIBBONS, and A. HENSCHEL. *New England Journal of Medicine* [*New Engl. J. Med.*] **243**, 899–905, Dec. 7, 1950. 6 figs., 12 refs.

A study was made at the Department of Medicine, University of Minnesota, and U.S. Veterans Administration Hospital, Minneapolis, of 8 men suffering from hypertension. All had resting systolic blood pressures above 165 mm. Hg and resting diastolic blood pressures above 105 mm. Hg. All suffered from headaches and showed at least some retinal changes. Four patients suffered from breathlessness on exertion, but all had apparently normal renal excretion. During control periods of 25 to 54 days they were given a diet yielding some 3,000 Calories and containing 100 g. of protein and about 10 g. sodium chloride daily, but none of the patients showed a fall in the blood pressure under these conditions. Then they were given a rice and fruit diet for periods of 22 to 102 days. The rice and fruit diet gave 2,000 Calories and 22 g. of protein daily, but it contained only 22 mg. of sodium chloride daily and practically no fat. Essential vitamins, however, were added to the rice and fruit diet. Five patients were given this diet for a further 2 to 6 weeks, but with a daily addition of 40 g. of milk protein from which sodium had been removed by dialysis. Finally 3 patients were given the rice and fruit diet for another 3 weeks without added protein, but with 10 g. of sodium chloride daily. All patients lost about 1·5 kg. each week while they were on the rice and fruit diet, which was partly caused by loss of body fat (estimated from measurements of the specific gravity according to Behnke's method) and in part to loss of extracellular fluid. Three patients, however, lost much active body tissue as well. At the same time the systolic blood pressure of all patients fell by 10 to 60 mm. Hg, and the diastolic blood pressure by 6 to 40 mm. The rice and fruit diets were also followed by a lowering of the serum cholesterol levels and by a lessened rise in the blood pressure in response to immersion of a hand in cold water (" cold pressor test "). If protein free from salt was added the blood pressure remained at its lowered level, but if sodium chloride was added the blood pressure tended to rise again. The authors concluded that the rice and fruit diet had no specific effect on hypertension and that its effects were those of a low-calorie and low-sodium diet. They also suggested that the loss of protein and sodium caused by the rice and fruit diet make its use undesirable, except as a temporary measure in fat patients whose kidneys are healthy. *E. M. Glaser*

2417. **Congenital Absence of the Pericardium. A Case Report**
B. G. P. SHAFIROFF. *Journal of Thoracic Surgery* [*J. thorac. Surg.*] **21**, 30–33, Jan., 1951. 4 figs., 7 refs.

2418. **The Electrocardiographic Diagnosis of Aneurysm of the Heart.** (Zur Diagnostik des Herzwandaneurysmas im Electrokardiogramm)
L. SLAPAK. *Cardiologia* [*Cardiologia, Basel*] **17**, 265–288, 1950. 3 figs., 32 refs.

Observations are recorded on 62 cases of left ventricular aneurysm following myocardial infarction: 13 cases were diagnosed radiologically and the remainder proved at necropsy. In 5 cases a bundle-branch block existed, and in 3 cases multiple old and fresh infarctions made electrocardiographic analysis difficult. In all other cases electrocardiograms showed persisting signs of a fresh infarct in one or several leads, such as elevation or depression of S–T and large Q. The author's conclusion appears justified that the persistence of these signs suggests a diagnosis of cardiac aneurysm. *G. Schoenewald*

2419. **Electrocardiographic Patterns in Slight Coronary Attacks**
C. PAPP and K. S. SMITH. *British Heart Journal* [*Brit. Heart J.*] **13**, 17–31, Jan., 1951. 12 figs., 12 refs.

" Slight coronary attacks " are here defined as episodes of cardiac pain, generally occurring at rest, lasting 30 minutes or more, unrelieved by trinitrin, and accompanied by persistent electrocardiographic changes of myocardial ischaemia, yet without clinical evidence of extensive myocardial necrosis such as a severe fall in blood pressure or heart failure, and usually without fever or leucocytosis.

Of 109 consecutive patients with myocardial infarction, drawn from hospital, consulting, and general practice, 33 had slight coronary attacks: three-quarters were men: three-quarters were aged between 50 and 69 years. Half had had angina of effort before the attack. Two patients had two attacks each, so that 35 attacks in all were seen. The electrocardiogram showed the pattern

of a posterior lesion in 9 cases, of which 3 were postero-lateral, and an anterior lesion in 26 cases, of which 17 were antero-septal, 7 antero-lateral, and 2 antero-apical. T-wave changes were conspicuous and ST-coving and high take-off were common; 7 had pathological Q waves, 3 had diminished R waves, and only one had a frank current of injury. In 6 the abnormalities persisted, and the remainder either recovered or very greatly improved, the recovery taking place in anything from a fortnight to a year or more. Pathologically the lesions were thought to be patches of intramural or sub-endocardial infarction without " through and through " necrosis.

All patients made a full recovery without any complications attributable to their coronary attacks. Absolute rest and prolonged stay in bed did not appear to be essential; anticoagulant therapy was not used.

J. A. Cosh

2420. **Unipolar Electrocardiography in Pulmonary Stenosis**

R. M. MARQUIS. *British Heart Journal* [*Brit. Heart J.*] **13**, 89–101, Jan., 1951. 10 figs., 19 refs.

The electrocardiographic findings are presented in 7 cases of pulmonary stenosis with intact ventricular septum. Unipolar chest leads are illustrated in the 6 cases occurring in children. Diagnosis was confirmed at necropsy in 4; 2 of the children died suddenly without warning, one child died suddenly during thoracotomy, and one patient (a young adult) died of pulmonary tuberculosis. In all there was electrocardiographic evidence of severe or extreme right ventricular hypertrophy which was not apparently proportional to the patient's disability or to radioscopic evidence of right ventricular enlargement. Typical severe changes were: marked right axis shift, P_2 of 4 mm. or more, a tall R wave in aVR, tall R waves in leads V_1 to V_5, ST depression in leads V_1 to V_4 or beyond, and T-wave inversion in leads V_1 to V_5 or V_6. In 3 cases the electrocardiographic abnormalities increased over the course of a few years, but in one, as a result of infective endocarditis destroying the stenosed pulmonary valve, the patient's condition improved considerably and there was no advance in the evidence of right ventricular hypertrophy.

It is concluded that unipolar electrocardiography gives valuable evidence of the severity of pulmonary stenosis by indicating its effect upon the right ventricle; where ventricular hypertrophy is extreme, pulmonary valvulotomy may be justified before clinical deterioration sets in.

J. A. Cosh

2421. **Electrocardiographic Changes in Pulmonary Embolism with Special Reference to an Early and Transient Shift of the Electrical Axis of the Heart**

P. T. KUO and J. B. VANDER VEER. *American Heart Journal* [*Amer. Heart J.*] **40**, 825–838, Dec., 1950. 7 figs., 31 refs.

In 3 cases in which minor pulmonary embolism was suspected clinically, and in which electrocardiograms were obtained within 2 hours of the acute pulmonary episode, the following pattern was noted: (1) sinus tachycardia; (2) prominent Q_3 and T_3; (3) prominent S in lead aVL, with little or no S_1; (4) generalized lowering of all waves in all leads, most marked in the leads that record the potentials of the epicardial surface of the left ventricle; (5) some shift of the transitional region to the left. This pattern often returned to normal in a few hours, but a mild degree of tachycardia and a lowering of the amplitude of all waves might persist for a few days.

The authors attribute these changes to a combination of (*a*) a dilated right ventricle bulging and projecting itself in the anterior plane of the body in the precordial region; (*b*) rotation of the heart on its antero-posterior axis, giving it a relatively vertical position in the chest; (*c*) a diffuse functional disturbance of the myocardium due to decreased cardiac output and venous drainage of the heart, resulting in lowering of the coronary blood flow. In one case, in which electrocardiograms were taken 18 hours after a massive pulmonary embolism, the findings were: (1) deep S_1 and prominent Q_3; (2) RS type of QRS in lead aVL; (3) low R in aVF; (4) RS type of QRS in all precordial leads. In 2 cases the electrocardiograms were " quite characteristic of the acute cor pulmonale pattern ", while in the remaining patient, who was in severe and prolonged shock after massive pulmonary embolism, there was a multitude of electrocardiographic abnormalities, including transient auricular fibrillation. Emphasis is laid upon the importance of obtaining records in such cases as soon as possible after the acute attack, and the value of augmented unipolar limb and multiple central terminal chest leads.

William A. R. Thomson

2422. **The Q–T Interval in Rheumatic Disease in Children**

L. M. TARAN and N. SZILAGYI. *British Heart Journal* [*Brit. Heart J.*] **13**, 10–16, Jan., 1951. 6 figs., 7 refs.

A study was made of 140 rheumatic children, aged 6 to 16 years, at the St. Francis Sanatorium, Long Island. Different observers assessed the degree of rheumatic activity, the severity of the cardiac lesions, and the electrocardiographic findings. The duration of electrical systole, corrected for rate (QTc), was determined according to Bazett's formula several times for each child: 0·405 second was taken as normal; 0·44 second would be considered a moderate prolongation.

The larger group, of 123 children, were observed throughout a single admission period averaging 12 months for each child. In 33 the QTc was initially normal or only moderately prolonged; it became shorter during the stay in hospital: only a fifth of these had progressive heart disease. In 39 the QTc remained unchanged, and in a third of these, in whom the QTc was also prolonged, there were progressive heart lesions. In 51 the QTc became longer while in hospital: three-quarters of these had progressive heart disease. Where the QTc was initially prolonged as well as increasing, 19 out of 20 had severe and progressive lesions: 4 of these died. The smaller group, of 17 children, were observed during several admission periods for an average total time of 4½ years per child. Where the QTc

was little, if at all, prolonged and tended to become shorter, cardiac lesions were unimportant; but where QTc was initially considerably prolonged and tended to become still longer, lesions were, or became, severe.

The authors conclude that serial observations on the corrected systole time have a prognostic value. The prognosis is bad where systole remains prolonged over a long period of time, especially if it becomes progressively longer. *J. A. Cosh*

2423. **Intracavitary Electrocardiographic Study of the Wolff–Parkinson–White Syndrome and its Induction by Excitation of the Interventricular Septum.** (Étude des dérivations intra-cavitaires du syndrome de Wolff–Parkinson–White et son déclenchement au moyen de l'excitation de la cloison inter-ventriculaire),
E. COELHO, J. M. FONSECA, A. S. BORGES, A. NUNES, and E. PAIVA. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **27**, 8–16, Jan. 2, 1951. 14 figs., 14 refs.

The Wolff–Parkinson–White syndrome was studied with intracavitary electrocardiography as described by Coelho. Detailed tracings are given of 4 cases in which the syndrome occurred spontaneously. The condition was investigated experimentally both in man and in the dog. Tracings were obtained from 4 patients in whom the walls of the atria and ventricles were stimulated by means of a catheter. In dogs, ectopic foci of excitation were produced by injection of alcohol and silver nitrate into the heart muscle.

It is concluded that in many cases the Wolff–Parkinson–White syndrome is a result of an ectopic focus of excitation in the interventricular septum. *F. A. Langley*

2424. **Electrocardiographic Changes associated with Allergic Reactions to Penicillin**
M. J. BINDER, H. J. GUNDERSON, J. CANNON, and L. ROSOVE. *American Heart Journal* [*Amer. Heart J.*] **40**, 940–944, Dec., 1950. 3 figs., 12 refs.

Details are given of 3 patients with severe allergic reactions to penicillin in whom electrocardiographic changes were noted. These consisted of: Case 1, inversion of T in all limb leads and in V_5. Case 2, inversion of T in leads II, III, V_4, V_5, and V_6; T_1 isoelectric. Case 3, T low upright in leads I and V_5, isoelectric in II, diphasic in V_3 and V_4, inverted in V_2. In all 3 cases the electrocardiograms were normal within 1 to 3 weeks. A further series of 25 patients with mild allergic reactions during penicillin therapy were studied, but in none of these was there any electrocardiographic abnormality, suggesting that electrocardiographic changes occur only in severe penicillin reactions. *William A. R. Thomson*

2425. **Cavity Potentials of the Human Ventricles**
H. A. ZIMMERMAN and H. K. HELLERSTEIN. *Circulation* [*Circulation*] **3**, 95–104, Jan., 1951. 11 figs., 10 refs.

The potential changes in the left ventricular cavity in man were recorded by the method of retrograde ulnar arterial catheterization. Negative potentials were recorded during depolarization, as was to be expected from the work of Wilson and others. *Albert Venner*

HEART

2426. **Aureomycin in the Treatment of Bacterial Endocarditis. Report of Nine Cases together with a Study of the Synergistic Action of Aureomycin and Penicillin in One Case**
H. W. SPIES, H. F. DOWLING, M. H. LEPPER, C. K. WOLFE, and E. R. CALDWELL. *Archives of Internal Medicine* [*Arch. intern. Med.*] **87**, 66–78, Jan., 1951. 6 figs., 12 refs.

The authors point out that acute bacterial endocarditis (as contrasted with subacute) continues to be a disease with a very high fatality rate. Many of the fatalities result from infection with organisms which are relatively resistant to penicillin. Streptomycin is considered unsuitable as it is toxic when used in large doses for long periods. The authors report 9 cases where the causal organisms were haemolytic streptococci, pneumococci, and staphylococci. The importance of studies *in vitro* of sensitivity to antibiotics is stressed. In one case aureomycin and penicillin were found to be synergistic and therapy with the two antibiotics brought about recovery. Two patients recovered with aureomycin therapy alone, and in another patient aureomycin treatment failed but recovery took place with penicillin. There was still a very high death rate, 5 of the 9 patients dying. One of these, however, had extensive miliary tuberculosis and the others had either a ruptured valve cusp or suffered from congestive heart failure which accounted for the fatal outcome. *J. McMichael*

2427. **Prognosis in Bundle Branch Block. I. Factors Influencing the Survival Period in Right Bundle Branch Block**
—., SHREENIVAS, A. L. MESSER, R. P. JOHNSON, and P. D. WHITE. *American Heart Journal* [*Amer. Heart J.*] **40**, 891–902, Dec., 1950. 35 refs.

This report is based upon an analysis of 281 cases of proven right bundle-branch block. Males predominated over females by about 3 to 1 (203 males; 78 females), and the majority of cases (219) occurred in the 50 to 79 age group. At the end of the period of study 93 patients were known to be alive, 93 to be dead, and in 95 information was lacking. Death within one year had occurred in 45 of the 196 patients who could be traced (23% of those traced). The average survival time (in years) of those alive after 1 year was 6·8 in the 40 to 49 age group, 6·3 in the 50 to 59 age group, and 5·1 in the 60 to 69 age group. The degree of cardiac enlargement exerted a definite influence on the prognosis: the average survival period of those with no enlargement was 4·2 years, compared with 2·4 years for those with marked cardiac enlargement. An aetiological classification showed that the average survival time was lower in coronary heart disease (3·0 years) and rheumatic heart disease (2·4 years) than in hypertensive heart disease (3·4 years), but in all three it was lower than in the "undetermined aetiology" group (4·3 years). The electrocardiogram was of little prognostic value, except that patients with a QRS conduction time of 0·12 second had a slightly less favourable prognosis than those with

QRS intervals of 0·13 and 0·14 second. This curious discrepancy may be explained by the fact that a higher percentage of those with QRS duration of 0·12 second had marked cardiac enlargement. No evidence was obtained that any prognostic significance could be attached to the direction of T_1 or the classification of the conduction disturbance as typical or atypical, concordant or discordant. It is concluded that " though *per se* an indication of some degree of heart disease, right bundle branch block is not infrequently found in persons surviving more than 5 years after its discovery ".

William A. R. Thomson

2428 (*a*). **Basic Hemodynamic Changes Produced by Aortic Coarctation of Different Degrees**
T. C. GUPTA and C. J. WIGGERS. *Circulation* [*Circulation*] **3**, 17–31, Jan., 1951. 6 figs., 33 refs.

2428 (*b*). **The Effects of Arterial and Pulmonary Shunts on the Dynamics of Aortic Coarctation**
T. C. GUPTA. *Circulation* [*Circulation*] **3**, 32–41, Jan., 1951. 4 figs., 14 refs.

Pressure pulses from the aorta at different levels, from the femoral artery, and from the left ventricle were recorded in dogs by calibrated optical manometers before and after application of varying degrees of aortic constriction. The tracings provide evidence that the hypertension above the constriction in coarctation of the aorta is due to the reduced capacity and distensibility of that part of the aorta available to receive immediately the ejected contents of the left ventricle; increased systolic ejection from the left ventricle is also a factor.

The second paper deals with results obtained in similar experiments in which shunts were introduced between the subclavian artery and the aorta distal to the constriction, or between the aorta and the pulmonary artery.

Albert Venner

2429. **Left Ventricular Pressures in Patients with Aortic Insufficiency Studied by Intracardiac Catheterization**
H. A. ZIMMERMAN. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1601–1603, Dec., 1950. 1 fig. 8 refs.

The pressure levels within the left ventricular cavity have been studied in 10 human subjects with aortic insufficiency by catheterization of the left ventricle via the radial artery. The 3 patients who exhibited no clinical evidence of congestive failure had normal left ventricular diastolic pressures. The 7 patients in obvious congestive failure demonstrated significant increases in diastolic pressure averaging 25 mm. of mercury.—[Author's summary.]

2430. **Pulmonary Hypertension in Mitral Stenosis**
R. I. S. BAYLISS, M. J. ETHERIDGE, and A. L. HYMAN. *Lancet* [*Lancet*] **2**, 889–894, Dec. 30, 1950. 3 figs., 24 refs.

In 22 patients with mitral stenosis the right ventricular and/or pulmonary-artery pressures have been correlated with clinical, radiological, and electrocardiographic findings. Pulmonary hypertension at rest was found in 17 patients. In general, those with the most severe symptoms had the highest pressures, but the duration of symptoms was not related to the degree of pulmonary hypertension.

Patients with severe pulmonary hypertension without peripheral venous congestion presented a recognizable syndrome, characterized by predominant pulmonary symptoms and electrocardiographic evidence of right ventricular hypertrophy. Patients with lesser degrees of pulmonary hypertension did not present characteristic features, but right ventricular enlargement on fluoroscopy was a constant finding. The degree of pulmonary hypertension, however, can be determined only by direct measurement. Right ventricular enlargement was found in all patients with pulmonary hypertension. There was no relation between the size of the left atrium and the degree of pulmonary hypertension.

On exercise a striking rise in pulmonary-artery pressure occurred without a significant increase in cardiac output. The pulmonary hypertension at rest and on exercise is due to stenosis of the mitral valve and to increased pulmonary arteriolar resistance. The relative importance of these two factors is discussed.—[Authors' summary.]

CORONARY ARTERY DISEASE

2431. **Studies on the Effect of Oral and Parenteral Administration of Visammin (Khellin) in Patients with Angina Pectoris**
R. C. SCOTT, A. IGLAUER, R. S. GREEN, J. W. KAUFMAN, B. BERMAN, and J. MCGUIRE. *Circulation* [*Circulation*] **3**, 80–88, Jan., 1951. 26 refs.

Twenty patients were observed for control periods, and then given oral visammin or a placebo. Effects were judged chiefly by the frequency of attacks of angina, but also by the results of an exercise tolerance test with electrocardiograph tracings. In a few cases the result of parenteral administration was judged by its effect on exercise tolerance, the ballistocardiogram, and blood-pressure response to tilting. Of the 20 patients, 11 thought that their anginal attacks were less severe or less easily induced while on visammin, but in only 4 were the attacks less frequent. In only 2 out of 9 cases was there improvement in the exercise test. No significant change occurred in the ballistocardiogram or blood-pressure responses. Seventeen patients experienced unpleasant side-reactions, some while on subtherapeutic doses. The authors conclude that visammin benefits some patients, but many others cannot tolerate the drug in adequate therapeutic doses.

Albert Venner

2432. **Nicotinamide in the Treatment of Coronary Insufficiency.** (Amid kwasu nikotynowego w niedomodze wiencowej)
D. ALEKSANDROW and E. WARSZAWSKIEGO. *Polskie Archiwum Medycyny Wewnetrznej* [*Polskie Arch. Med. wewn.*] **20**, 124–128, 1950. 14 refs.

Encouraging results are reported with intravenous injections of nicotinamide in the treatment of angina pectoris. A dose of 100 mg. was given daily for a period of 15 to 20 days, followed by a maintenance dose twice

weekly. Out of 15 patients treated, 3 had no further anginal attacks during the period of follow-up, which lasted 1½ years. In 7 cases the attacks became less frequent; there was no improvement in 4 cases and a doubtful response in one. The injections should be given slowly because they may precipitate an attack of angina. There is pharmacological evidence that in higher concentration nicotinamide exercises a vasospastic action on the coronary arteries, but with slow injection no untoward effects were encountered. *J. T. Leyberg*

2433. **The Ageing of Cardiac Infarcts, and its Influence on Cardiac Rupture**
I. LODGE-PATCH. *British Heart Journal* [*Brit. Heart J.*] **13**, 37–42, Jan., 1951. 5 figs., 8 refs.

The infarcted heart muscle was studied histologically in 18 cases in which death had been due to a recent cardiac infarct occurring at a precisely known time. The age of the infarct was found to be fairly closely related to the nature of the cellular reaction.

Oedema and neutrophil polymorphonuclear leucocytes appeared within a few hours. At 48 hours polymorphonuclear leucocytes were massed around the periphery of the infarct, and increased to their maximum number between the 3rd and 5th day. Outside this layer macrophages appeared on the 4th day, and by the 9th contained ingested pigment from dead muscle cells; they were maximal in number by the 6th week. Small lymphocytes appeared towards the end of the first week, with plasma cells, increasing to a maximum at 3 weeks. Eosinophils were seen in the 2nd week, and were most numerous in the 3rd, but their behaviour was very variable. Fibroblasts were seen on the 4th day, becoming arranged parallel to muscle fibres and pericardium after 2 or 3 weeks. In the dead muscle cells nuclear changes were first noted at 5 hours and cytoplasmic changes within 12 hours. Phagocytosis of dead muscle tissue might be incomplete in a large infarct even after many months. Estimation of the age of an infarct on evidence such as the above was considered to be accurate within 24 hours in infarcts up to a week old: within 48 hours in infarcts 1 to 2 weeks old: and within 7 days in infarcts up to 6 weeks old.

On the basis of these conclusions, the age of the infarct was estimated in 9 cases in which death was due to cardiac rupture complicating infarction. The age of the infarct at the time of rupture was found to vary between 1 and 14 days. *J. A. Cosh*

2434. **Experiences with Dicumarol in Acute Myocardial Infarction**
E. BRESNICK, L. A. SELVERSTONE, B. RAPOPORT, K. CHESKEY, H. N. HULTGREN, and H. S. SISE. *New England Journal of Medicine* [*New Engl. J. Med.*] **243**, 806–810, Nov. 23, 1950. 10 refs.

A series of 250 cases of acute myocardial infarction admitted to the Boston City Hospital between 1946 and 1948 was investigated to determine the value of dicoumarol therapy under ordinary hospital conditions. Alternate cases (or later, cases admitted on alternate days) served as controls. Patients dying in the first 3 days of their illness or first 2 days of therapy, and those admitted more than 5 days after onset, were omitted from both groups. All had electrocardiographic evidence of infarction. The usual contraindications to dicoumarol were observed, and dosage was controlled by prothrombin estimation by the Quick method.

Thrombo-embolic episodes occurred in 20·3% of 120 control cases and 15·6% of 122 treated cases, but mortality was 18·9% in the treated group, and 12·5% in the control group. [It is pointed out here, without comment, that some of the more severely ill cases were treated with dicoumarol out of turn.] Two patients died in the treated group from haemorrhage due to dicoumarol, and other haemorrhagic episodes occurred in 9. A prothrombin level of 30 to 50% was aimed at during the first year, and afterwards 15 to 30%, but neither was at all consistently attained, mainly, apparently, due to inadequate control of dicoumarol dosage.

The authors conclude that dicoumarol therapy is of doubtful value and often dangerous under ordinary hospital conditions. *J. W. Litchfield*

2435. **Arrhythmia in Myocardial Infarction.** (Infarctus du myocarde et troubles du rythme)
L. TATIBOUET and A. MATHIVAT. *Archives des Maladies du Cœur et des Vaisseaux* [*Arch. Mal. Cœur*] **43**, 981–995, Nov., 1950. 3 figs., bibliography.

Out of 420 cases of coronary thrombosis, disturbances of rhythm were observed in 37 cases. Auricular fibrillation was commonest (14 cases); ectopic beats occurred, rather surprisingly, in 10 cases only; auricular flutter twice; ventricular tachycardia 6 times (fatal in 4 cases); in 5 cases complete A-V block developed. No correlation between the location of the infarct and the disturbance of rhythm was apparent. *G. Schoenewald*

2436. **Unipolar Precordial Electrocardiograms in Ventricular Aneurysm**
G. A. PIPILIS and P. H. WOSIKA. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 147–152, Jan. 20, 1951. 4 figs., 29 refs.

A report is made of 5 cases of ventricular aneurysm from the Illinois Masonic Hospital; all were confirmed at necropsy. Electrocardiographic findings are discussed. Four patients were men, aged from 58 to 65, and the fifth was a woman diabetic of 73. All had severe coronary atheroma, and this was fundamentally the cause of death, save in one man dying of carcinoma of the lung. None was hypertensive.

The electrocardiographic changes were essentially those of cardiac infarction, which was anterior in 4 and posterior in one; the aneurysms were correspondingly antero-apical and posterior. Three cases showed deep QS waves and ST elevations in leads between V_1 and V_4; in 2 these changes were due to infarction shortly before death, but in one they persisted for several months, as has been described in ventricular aneurysm. In 2 cases conduction defects gave patterns similar to left bundle-branch block. In 2 cases aneurysm was clinically and radiologically diagnosable, being due to infarctions occurring respectively 4 and 9 years before

death. The remainder had histories only of recent cardiac pain.

[Clinical details are scanty, and descriptions of the aneurysms and their sites are incomplete.]

J. A. Cosh

2437. **The Effects of the Single and Double " Two-step " Exercise Tests upon the Electrocardiograms of 200 Normal Persons**

L. SCHERLIS, A. A. SANDBERG, J. WENER, J. DVORKIN, and A. M. MASTER. *Journal of the Mount Sinai Hospital* [*J. Mt Sinai Hosp.*] **17**, 242–253, Nov.–Dec., 1950. 8 figs., 14 refs.

Electrocardiograms were taken on 200 normal subjects (95 men and 105 women, aged between 17 and 57 years) immediately on completing standard exercise tests, and 1, 2, and 5 minutes thereafter. The single test consisted in mounting and descending two steps during 1½ minutes for a number of times determined by the subject's sex, age, and weight. This and the double test, lasting 3 minutes, were performed by each subject on different days. With a direct-writing electrocardiograph leads I, II, III, and V_4 or V_5 could all be taken in about half a minute.

The RS–T segment was depressed in 13 subjects immediately after one or other or both tests; with one exception these depressions were between 0·5 and 1 mm. and they were usually best seen in the chest lead or in lead II. In 8 the depression was still found one minute after ceasing effort, in one at 2 minutes, and none subsequently. After the single test 4 of these 13 had RS–T depressions of 0·5 to 1 mm., and a fifth had a depression of 1·5 mm. After the double test, 11 of the 13 had depressions of 0·5 to 1 mm. These findings occurred in all age groups, 9 patients being under 30. In these 13, both the absolute pulse rate after effort and the increase in pulse rate due to effort were relatively great. No significant changes were seen in P or T waves, P–R intervals or QRS complexes. One subject, who had auricular premature systoles initially, developed a transient ectopic auricular rhythm after effort.

J. A. Cosh

BLOOD VESSELS

2438. **Neurologic Manifestations associated with Dissecting Aneurysm of the Aorta**

F. P. MOERSCH and G. P. SAYRE. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1141–1148, Dec. 2, 1950. 4 figs., 20 refs.

This very readable article touches first on historical landmarks in the condition of dissecting aneurysm, beginning with the sixteenth century and including a reference to the case of King George II. The difficulties of clinical diagnosis are mentioned and then figures are adduced to show that the disease is found in one out of 400 to 500 post-mortem examinations; 3 males are affected for every female and it is in the fifth and sixth decades that it most commonly occurs; 80 to 85% of sufferers die within 2 weeks of onset as a result of rupture into a body cavity. The pathological process may result from degenerative, congenital, inflammatory, traumatic, or mechanical causes; 50 to 55% of cases are usually diagnosed ante mortem.

The clinical picture is primarily that of a sudden painful catastrophe with pain in the chest, back, or abdomen, radiating to legs but rarely to the arms; 26 cases are discussed, the result of a 26-year survey of the files of the Pathology Department of the Mayo Clinic; 12 of these cases showed neurological complications affecting the brain or spinal cord or both, producing hemiplegia, convulsions, periods of unconsciousness, transverse myelitis, and weakness of the limbs.

Details are given of 4 cases, including a case of transverse myelitis and one case of hemiplegia due to a coexistent cerebral haemorrhage. Clinical and pathological features are then correlated, leading to the conclusion that the neurological complications follow cerebral or spinal patterns, the peripheral nerves being little involved. The cerebral manifestations are explicable in some cases on an anatomical basis, such as compression of the carotid or other vessels by dissection: at times these cerebral manifestations are independent of any actual involvement of the vessels supplying the brain and are then accounted for by " alterations in cerebral blood flow resulting from shock ". The spinal manifestations, which are less common, are easily explained by occlusion of the intercostal arteries from which the spinal arterial supply derives. [These points are illustrated by clear diagrams.]

Fergus R. Ferguson

2439. **Dissecting Aneurysm of the Aorta with Renal Complications**

H. BREBNER. *British Medical Journal* [*Brit. med. J.*] **1**, 394–395, Feb. 24, 1951. 7 figs., 13 refs.

An interesting case of dissecting aneurysm of the aorta is described, the dissection having occurred some time before death. At necropsy an extensive lesion was found to have involved the left renal artery causing multiple infarcts of the kidney. The clinical picture of renal failure was characterized by a rapidly progressive hypertension. The possible role of this unilateral renal lesion in the aetiology of the hypertension is discussed.

G. J. Cunningham

2440. **Hypertension and Renal Dynamics in Aortic Coarctation**

J. S. HARRIS, W. C. SEALY, and W. DEMARIA. *American Journal of Medicine* [*Amer. J. Med.*] **9**, 734–746, Dec., 1950. 2 figs., 46 refs.

The evidence showing that it is not possible to explain the hypertension in coarctation of the aorta solely as a result of the mechanical lesion is reviewed. In an attempt to elucidate the problem of the hypertension in such cases the brachial and femoral blood pressures and renal function (glomerular filtration rate, renal plasma flow, and renal blood flow) were determined in 4 patients before operation and 5 to 7 days and 2 to 4 months afterwards. No correlation was found between renal dynamics and the blood-pressure changes. It is therefore concluded that, while some mechanism other than the increased resistance imposed by the constriction is

necessary to explain the hypertension of coarctation of the aorta, this mechanism is not based on renal ischaemia.

C. Bruce Perry

2441. **Evaluation of Treatment in Intermittent Claudication**

J. T. SHEPHERD. *British Medical Journal* [*Brit. med. J.*] **2**, 1413–1418, Dec. 23, 1950. 8 figs., 12 refs.

The effect of exercise upon blood flow in legs subject to intermittent claudication was investigated, a venous-occlusion plethysmograph and an ergograph designed to exercise mainly the calf muscles being used. In normal subjects exercise is followed by a rapid fall in blood flow to normal from a high level. Two types of response occurs in claudication, a slow fall from a reduced level, and a gradual rise to a maximum from a low initial level, followed by a gradual fall (*Clin. Sci.*, 1950, **9**, 49).

In 8 cases of intermittent claudication the number of contractions necessary to cause pain and fatigue (the " claudication index "), and blood flow in the calf after exercise were estimated on four occasions. " Padutin " was then given for an average of 16 weeks until doses of 6 to 9 biological units weekly by injection and 30 drops (10 units per ml.) three times a day by mouth were reached. The claudication index and blood flow after exercise were measured, usually weekly, either before or shortly after the injection of padutin. By these criteria padutin was without effect in either group. The patients varied in their opinion of the usefulness of the drug.

All patients smoked cigarettes, averaging 20 a day. Four stopped smoking for 2 months without affecting either measurement. Neither measurement was affected by reflex vasodilatation in response to heat or by 500 mg. tetraethylammonium bromide given intravenously shortly before the end of the work period. Similar lack of change was found in 8 cases after lumbar sympathectomy.

D. Verel

2442. **Temporal Arteritis. Two Cases Treated with Aureomycin**

J. M. RICE-OXLEY and A. M. COOKE. *Lancet* [*Lancet*] **1**, 89–90, Jan. 13, 1951. 3 refs.

The signs and symptomatology of temporal arteritis are summarized and detailed descriptions of two typical cases are given. In the first case the diagnosis was confirmed by biopsy. Following the biopsy there was an immediate improvement in the pain but the constitutional symptoms persisted. Aureomycin, 500 mg. 6-hourly for 2 weeks, resulted in a complete and lasting clinical recovery. In the second case, although the diagnosis was not confirmed by biopsy, the symptoms and signs were such as to make the diagnosis certain. There was a less dramatic response to aureomycin, largely owing to the patient's intolerance to the drug. Nevertheless there was ultimate complete recovery. Temporal arteritis is a self-limited disease with a duration of at least 4 months and often considerably longer. The duration of the disease in the 2 treated cases was 7 and 11 weeks. It is thus reasonable to infer that the aureomycin exerted an effect in these cases.

Geoffrey McComas

2443. **Results of Treatment of Thrombo-angiitis Obliterans by Means of Hypoglycaemia in 90 Cases.** (Wyniki leczenia zarostowego zakrzepowego zapalenia neczýn stanami niedocukrzenia na podstawie 90 przypadków)

J. KANIAK. *Polskie Archiwum Medycyny Wewnetrznej* [*Polskie Arch. Med. wewn.*] **20**, 296–305, 1950.

This is a survey of 90 cases of Buerger's disease treated with insulin and mild hypoglycaemia. Up to 100 units of insulin was given twice daily and the patients were allowed to remain in a state of mild stupor; the hypoglycaemic state was interrupted after 2 to 3 hours by a drink of glucose or sweet tea. Most of the patients had previously failed to respond to other methods of surgical or medical treatment. A course of treatment lasted for 60 days. Some of the cases were of exceptional severity, with trophic changes and gangrene. The cases were grouped according to the stage and severity of the condition. Of 49 patients with a mild form of the disease 38 made excellent recovery, and of 20 in whom the disease was severe 8 recovered and 6 improved. The follow-up period extended up to 2 years. The author admits that he is unable to explain his results on theoretical grounds, but believes that this form of treatment is of definite practical value and should be tried before other drastic measures are carried out.

J. T. Leyberg

2444. **The Action of a Kidney Extract on Increased Capillary Permeability after Nephrectomy.** (La accion de un extracto renal sobre la hiperpermeabilidad capilar post-nefrectomia)

J. M. LINAZASORO, H. CASTRO MENDOZA, and C. JIMÉNEZ DIAZ. *Revista Clinicia Española* [*Rev. clin. esp.*] **39**, 322–324, Dec. 15, 1950. 1 fig., 6 refs.

The authors have already shown that the proteinaemia which occurs after nephrectomy in dogs is relative, not absolute, and is due to the loss of plasma from the blood into the extracellular tissues. Dogs do not usually live long enough to develop gross oedema, but a goat, an animal known to tolerate nephrectomy better than the dog, developed oedema similar to that found in human beings with nephritis. The authors believe that the process is one of increased capillary permeability, which occurs when the restraining action of the kidney is removed. This restraint is due to the action of what they term " active renal substance " (A.R.S.) obtained by maceration of the kidney in a watery glucose solution. They treated 7 nephrectomized animals with this substance and injected a control series with glycerin. In the control series there was loss of plasma volume and increase in the volume of extracellular fluid in every case. In the test series there was a considerably smaller loss of plasma volume in 5 cases, and in 2 cases there was an increase. The extracellular fluid diminished in volume in every case. These results, the authors consider, show that capillary permeability is not increased through shock or uraemic intoxication but is increased simply on the withdrawal of A.R.S. from the circulation.

[There are no details of the experiments.]

J. G. Jamieson

See also Section Pathology, Abstract 2337.

Disorders of the Blood

2445. **Hematology of Atomic Bomb Casualties**
G. V. LEROY. *Archives of Internal Medicine* [*Arch. intern. Med.*] **86**, 691–710, Nov., 1950. 7 figs., 8 refs.

[This paper is a summary of part of the " Medical Report of the Joint Commission for the Investigation of the Effects of the Atomic Bomb in Japan ", Atomic Energy Commission Classified Document, 1946. All details are therefore compressed into tables and figures, which are most instructive but render abstracting unsatisfactory.]

The haematological changes observed between August and December, 1945, in casualties due to the atomic bombs dropped on Hiroshima and Nagasaki are described. Findings in large numbers of persons exposed to ionizing radiation were collected from three sources: (1) Japanese physicians; (2) routine examinations by the Commission on survivors in all parts of the cities; and (3) observations made in casualty hospitals by members of the Commission. Erythrocyte and leucocyte counts were carried out as a routine without specially standardized glassware. Haemoglobin was estimated by Haden–Hausser and Sahli techniques and by the copper sulphate method. Haematocrit measurements were made in Wintrobe tubes, and Wright's stain was used for differential counts. A variety of methods was used for platelet counting. From the large volume of clinical material two groups were selected: (1) patients in whom a diagnosis of " radiation injury " was made, and (2) persons exposed to ionizing radiation who survived 20 days or more. In the first group it was possible, by questionaries, to define epilation and purpura as specific radiation effects. Further analysis showed that vomiting on the day of bombing, oro-pharyngeal lesions, and haemorrhagic manifestations other than purpura were suggestive symptoms. In the second group the extent of the exposure was estimated from the linear distance of the victim from the explosion and from the shielding offered by buildings of various types (shelters, tunnels, heavy building, or wood building). From this it was possible to classify the subjects in eight graduated " exposure groups ". Correlation between the severity of the radiation injury and haematological changes was high. In severe cases leucopenia was a constant feature, and this was maximal when the symptoms of radiation injury were most marked during the third week after exposure. The normal differential distribution of leucocytes was maintained after exposure, but during convalescence the granulocyte count returned to normal by the 9th week, while the lymphocyte count remained depressed for 12 weeks or more. Haemoglobin levels reached a minimum in 6 to 8 weeks, then returned to normal; the erythrocyte count behaved similarly. The Price-Jones curve and mean corpuscular volume showed a slight shift to the right; the mean corpuscular haemoglobin concentration was unchanged. Platelet counts were much reduced, the lowest levels occurring during the 7th or 8th week after exposure. Bleeding and clotting times were excessively prolonged and capillary fragility, as determined by the vacuum method, was increased.

In the moderately severe and mild cases of radiation injury leucopenia was less pronounced and the return to normal was more rapid. All the haematological manifestations of injury were observed in varying degrees, and it appears that the extent of exposure to ionizing radiation may be assessed from the haematological findings. *H. Payling Wright*

2446. **Cytometric Researches on Erythroblasts Obtained from Normal Human Bone Marrow.** (Ricerche di citometria sugli eritroblasti del midollo osseo umano normale)
U. SALERA. *Haematologica* [*Haematologica*] **34**, 1–18, 1950. 6 figs., 23 refs.

Bone marrow obtained by sternal puncture from 5 healthy adults was examined. All smears were stained by the same technique with the same batch of stains. With a micrometer, 100 basophilic, 100 polychromatic, and 100 orthochromatic normoblasts were measured for mean nuclear and total diameters. The cytoplasmic diameter was determined in each case mathematically. Cell diameters and nuclear sizes diminish and the base of the distribution curve of diameters becomes narrower with maturation. *E. Neumark*

2447. **The Role of the Hypophyseal-hypothalamic System in the Pathogenesis of Erythraemia and Symptomatic Polycythaemias.** [In English]
E. HAYNAL and F. GRÁF. *Acta Medica Scandinavica* [*Acta med. scand.*] **139**, 61–77, 1950. 5 figs., bibliography.

The object of this paper was to elucidate the relationship between the pituitary and the central nervous system on the one hand and haematopoiesis on the other. This is based on the fact that erythrocytosis is sometimes due to some morbid condition of the midbrain, and on experimental evidence such as the abolition of erythrocytosis at high altitudes in hypophysectomized rats and the abolition of leucocytosis following the administration of bacterial substances to dogs with severed cervical cords. A series of 10 patients with polycythaemia rubra vera were investigated by tests aiming at the examination of pituitary function. In 8 cases glucose tolerance tests gave higher curves than normal, in 7 of them tests made after 20 units of insulin gave higher readings than normal, and in 6 cases tests made after the injection of 0·5 mg. of adrenaline gave flat curves. Rats which were given intramuscularly 1 ml. of cerebrospinal fluid from these patients developed high blood

sugar curves, and fluid from 8 patients produced increased water excretion in rats. Similar tests applied to 3 patients with congenital cardiac abnormalities and erythrocytosis, and to 4 patients with congestive cardiac failure, suggested pituitary hyperfunction. In 5 patients convalescent from other diseases administration of sex hormones did not influence the results of the tests conclusively. Erythrocyte counts and haematocrit values did not alter decisively in patients with polycythaemia after treatment with follicular or male sex hormone, or with *x* rays, though other tests suggested a decrease of pituitary function. The authors conclude that increased erythropoiesis may be caused by increased activity of the pituitary or the midbrain. *E. Neumark*

2448. **A Rapidly Fatal Case of Myeloid Leukaemia without Splenomegaly.** (Un cas de leucémie myélogène sans splénomégalie à évolution rapidement mortelle)
L. Béthoux, R. Seigneurin, and G. Cau. *Sang* [*Sang*] **22**, 76–77, 1951. 10 refs.

2449. **The Urinary Excretion of 17-Ketosteroids and Corticosteroids in Leucemia; the Effect of Aminopterin (4-Amino-pteroylglutamic Acid) on the Excretion of Corticosteroids in Acute Leucemia**
D. G. Hanlon, H. L. Mason, and J. M. Stickney. *Journal of Laboratory and Clinical Medicine* [*J. Lab. clin. Med.*] **36**, 877–886, Dec., 1950. 8 refs.

The urinary excretion of 17-ketosteroids was found to be low in 13 cases of acute leukaemia, and at the lower range of normal in another; in 4 cases of chronic leukaemia low values were also found [the types of leukaemia are not specified]. It is pointed out that low values for 17-ketosteroid excretion have been observed in many disease states, so that these findings in leukaemia have no specific significance. In 20 cases of untreated acute leukaemia the excretion of urinary corticoids, by the method of Corcoran and Page (*J. Lab. clin. Med.*, 1948, **33**, 1326), varied from 0·2 mg. to 1·29 mg. per day, being within normal limits in 15 of the cases. The value was slightly elevated in 4 cases and was subnormal in one case. Normal values for corticoid excretion were found in all of 8 cases of chronic leukaemia. So far as the production of glucogenic corticoids is concerned it may, therefore, be concluded that adrenal cortical function is uninfluenced by the disease.

Since the administration of toxic doses of aminopterin (4-amino-pteroylglutamic acid) to rats leads to atrophy of the thymus, spleen, and lymphoid tissues, but to hypertrophy of the adrenal cortex with evidence of increased secretion, and since previous adrenalectomy largely prevents the lymphoid involution, it seemed possible that evidence of increased adrenal activity, as measured by corticoid excretion, might be found in patients with leukaemia undergoing treatment with aminopterin. In point of fact, however, among 6 patients with acute leukaemia receiving 0·5 to 1 mg. per day, the usual therapeutic dose, a marked depression in corticoid excretion was found in 3 and a slight depression in one. The other 2 cases showed no appreciable change in corticoid excretion. Three possible causes for this unexpected result were considered: (1) a cytotoxic action on the adrenal cortex, with reduced secretory activity; (2) a toxic action on the pituitary with reduced production of adrenocorticotrophic hormone (ACTH); and (3) altered metabolism of cortical hormones. The first of these is rendered unlikely by the finding in one patient that injection of 25 mg. of ACTH at the time when aminopterin had markedly reduced the corticoid excretion brought about the usual prompt augmentation of urinary corticoid output. It is also unlikely that altered corticoid metabolism can be of significance, and thus the conclusion is reached that aminopterin probably depresses production of ACTH by the pituitary.
G. I. M. Swyer

2450. **Use of Pituitary Adrenocorticotropic Hormone (ACTH) and Cortisone in Lymphomas and Leukemias**
O. H. Pearson and L. P. Eliel. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1349–1353, Dec. 16, 1950. 15 refs.

This is a report on the results of treatment of 70 patients suffering from various types of neoplastic disease with pituitary adrenocorticotrophic hormone (ACTH) and cortisone acetate. Eight patients with chronic lymphatic leukaemia received 100 to 200 mg. ACTH or cortisone acetate per day for 18 days to 3 months. All patients showed appreciable shrinkage of large lymph nodes, liver, and spleen during treatment. Relapse occurred at varying intervals after treatment was stopped, and in some it occurred slowly in spite of continued treatment. Subsequent courses of treatment proved beneficial in 6 cases. Some patients showed a rise in haemoglobin value and erythrocyte count in the blood during treatment. In all patients there was a transitory rise in the leucocyte count followed by a fall to below pretreatment levels. In no patient was there alteration in the differential count or improvement in the bone-marrow picture.

Six patients with lymphosarcoma received ACTH or cortisone daily for 9 to 52 days. Definite shrinkage of tumour masses was observed in all cases: 4 patients were in the terminal stages of the disease when treatment was begun. They died during treatment in spite of transient improvement in the local condition. In some patients remissions lasted for 3 months after stopping treatment, and subsequent treatment failed to reveal any sign of refractoriness to the active substance.

Of 30 cases of acute leukaemia receiving one of the drugs, 13 showed " a good clinical and hematological remission " and 8 did not respond. Monocytic leukaemia appears to be unaffected by these hormones. In acute myeloid or acute lymphatic leukaemia remissions were of short duration and refractoriness to treatment rapidly developed. Of 6 patients with Hodgkin's disease 4 showed slight shrinkage of enlarged lymph nodes and spleen; lasting benefit was not obtained. A patient with plasma-cell myeloma obtained marked clinical benefit from ACTH. The bone-marrow picture remained unaltered. When treatment was stopped there was recurrence of symptoms within 24 hours.

[This paper provides very few details of treatment. Thus it is not stated which patients received cortisone

and which received ACTH, and nothing is said of the relative merits of these hormones in the treatment of the various forms of reticulosis.] *A. Brown*

ANAEMIA

2451. **The Erythrocyte Coproporphyrin. Variation in Respect to Erythrocyte Protoporphyrin and Reticulocytes in Certain of the Anemias**
C. J. WATSON. *Archives of Internal Medicine* [*Arch. intern. Med.*] **86**, 797–809, Dec., 1950. 4 figs., 17 refs.

Human erythrocytes contain free coproporphyrin in addition to protoporphyrin. In pernicious anaemia in relapse there is low or normal erythrocyte protoporphyrin and negligible or absent coproporphyrin; in iron-deficiency anaemia protoporphyrin increases, with little or no increase in coproporphyrin; haemolytic anaemias cause an increase in coproporphyrin and protoporphyrin. The erythrocyte coproporphyrin is a rather sensitive index of the rate of haemoglobin synthesis or attempted synthesis in the bone marrow. The theory is put forward that coproporphyrin III is the normal precursor of haemoglobin protoporphyrin. (Details of the method of estimation of coproporphyrin in erythrocytes have not yet been published.) *A. Brown*

2452. **Splenic Anaemia of the Griesinger Type.** (Sull' anemia splenica tipo Griesinger)
E. GREPPI and R. DI GUGLIELMO. *Minerva Medica* [*Minerva med., Torino*] **2**, 524–529, Sept. 29, 1950. 6 figs., 20 refs.

A woman of 48 years had an enlarged spleen, anaemia, neutropenia, and thrombocytopenia. Sternal marrow biopsy showed gross hypoplasia of myeloid and erythroid cells, but quite a number of lymphoid elements. After splenectomy the anaemia, neutropenia, and platelet deficiency remitted slightly and temporarily and the patient developed a definite lymphocytosis. The authors discuss the differential diagnosis of this case and mention Banti's disease, giant-follicular lymphoblastoma, splenic neutropenia, and, more generally, hypersplenism. The patient died after severe metrorrhagia. Lymphocytic infiltration was found in the liver. It is believed that this case belongs to the group of pre-leukaemic conditions for which so many names have been coined. *E. Neumark*

2453. **Intravenous Iron in Treatment of Hypochromic Anaemia associated with Rheumatoid Arthritis**
R. J. G. SINCLAIR and J. J. R. DUTHIE. *British Medical Journal* [*Brit. med. J.*] **2**, 1257–1258, Dec. 2, 1950. 7 refs.

Anaemia, either hypochromic or normochromic in type, is found in association with all forms of infection. It is common in rheumatoid arthritis. The present authors in 1949 described the response of 23 cases to intravenous iron; they have now treated a further 28 cases, making 51 in all. These patients all proved resistant to oral iron. A satisfactory rise in haemoglobin value was found in 38 cases but 13 remained refractory and only 2 of these responded to a second course of iron. In a further 13 cases the haemoglobin level was maintained for as long as 23 months without further treatment, and 3 patients who responded initially required a further dose. Ascorbic acid given intravenously was without effect in the refractory cases. The authors consider that iron absorption, as measured by the effect of oral iron on the plasma iron level, was normal even in refractory cases. They conclude that the anaemia is due to an increased need of the tissues for iron, a need which cannot be met by absorption of iron given by mouth. It is clear that experimental observations with radioactive iron might throw interesting light on the mechanism of this type of anaemia. In cases which responded to oral iron there was a rapid fall in erythrocyte sedimentation rate. It is suggested that the anaemia alone cannot account for the high rate and that there must be some associated change in serum protein levels. [Apart from interesting theoretical considerations raised by this paper, it is encouraging to know that in some cases of rheumatoid arthritis the anaemia can be relieved, a finding which is not corroborated by the work of Wintrobe and his colleagues (*J. clin. Invest.*, 1950, **29**, 1505).] *Janet Vaughan*

2454. **Comparative Cytometric Studies of the Eosinophil Series in Normal Human Bone Marrow and in Pernicious Anaemia.** (Ricerche citometriche comparative sulla serie eosinofila del midollo osseo umano normale e dell'anemico pernicioso)
G. ASTALDI, V. GALLO, and P. INVERNIZZO. *Haematologica* [*Haematologica*] **34**, 349–355, 1950. 1 fig., 13 refs.

In sternal-marrow smears from 10 normal adults and 10 patients with pernicious anaemia neutrophil and eosinophil myelocytes, metamyelocytes, and polymorphonuclear leucocytes were measured for cell size, nuclear size, and cytoplasmic diameter. In each cell group 50 cells were investigated. In pernicious anaemia it is not only the neutrophil series which shows an increase in average size, but also the eosinophils, although in the latter this increase is not so marked. *E. Neumark*

2455. **The Content of Haemopoietic Factors in Liver Extracts. Relationship to Clinical Response**
R. H. GIRDWOOD and K. M. CARMICHAEL. *British Medical Journal* [*Brit. med. J.*] **2**, 1357–1361, Dec. 16, 1950. 1 fig., 20 refs.

Fifteen batches of various British commercial liver extracts, manufactured between the years 1945 and 1950, were assayed for vitamin B_{12} and pteroylglutamic acid by microbiological methods, using *Lactobacillus leichmannii*, and *Streptococcus faecalis* respectively. The content of vitamin B_{12} ranged from 0·25 to 7·6 μg. per ml., while the pteroylglutamic acid content was negligible in all the samples. All but one of these preparations had been marketed as a high-potency extract. These same batches of liver extract were also used in small doses in the treatment of 20 patients suffering from Addisonian pernicious anaemia in relapse; the consequent rises in red cell count were compared with the rises that would be expected in response to equivalent doses of pure

vitamin B_{12} in accordance with modifications of previously published formulae. The authors are guarded in their conclusions, pointing out that too much importance should not be attached to formulae, and that although it is possible to obtain consistent results with a single microbiological method of vitamin-B_{12} assay, considerable variations may result from different methods. They do conclude, however, that their results are compatible with the assumption that the haematopoietic activity of liver extract is due to its vitamin-B_{12} content.

L. J. Davis

2456. **Familial Incidence of Pernicious Anaemia.** (Famigliarità dell'anemia perniciosa)
F. ROVELLO. *Haematologica* [*Haematologica*] **34**, 147–169, 1950. 37 refs.

Three sisters, aged 72, 65, and 57 years respectively, had typical pernicious anaemia, proved by haematological investigations and marrow biopsy. In another family a woman of 56 years and her daughter, aged 36 years, both had typical pernicious anaemia. The latter's daughter, aged 8 years, had moderate iron-deficiency anaemia. The author believes that gastric achylia, which was found in all these patients, plays an important part in the production of pernicious anaemia and that such a predisposition may be transmitted to children.

E. Neumark

2457. **Hemolytic Anemia Secondary to a Familial (Hereditary) Defect in Hemoglobin Synthesis. Report of a Case with Radioiron Studies**
H. MILLS, R. L. HUFF, M. A. KRUPP, and J. F. GARCIA. *Archives of Internal Medicine* [*Arch. intern. Med.*] **86**, 711–726, Nov., 1950. 4 figs., 23 refs.

The importance of genetic factors in certain anaemias is reviewed and the authors postulate the existence of a type of haemolytic anaemia secondary to a hereditary defect in the synthesis of haemoglobin. In support of their hypothesis they present the case history of a white male patient who manifested a normocytic anaemia on repeated blood examinations over 14 years. A comprehensive study of the patient's blood picture and bone-marrow smear showed stippled cells and "inclusion bodies". Chemical and serological studies of blood revealed no abnormality. Blood volume was normal, but plasma iron levels were unusually high at 2·0 to 2·2 μg. per ml. (normal = 1·4 μg.). The rate of plasma iron turnover was, moreover, shown to be about double that in the control group of normal subjects. The erythrocyte life, computed from the iron turnover rate, was only 45 days in their patient compared with the normal of 95 days. Treatment with iron orally and intramuscularly, liver intramuscularly and intravenously, folic acid, vitamin B_{12}, and massive doses of vitamins had no affect upon the anaemia.

The patient's history revealed that his father had a refractory anaemia, and his sister and his daughter were both anaemic. This history, together with the similarity of the patient's blood picture (cell inclusions) to that in other cases of known hereditary origin, the absence of antibodies of acquired haemolytic anaemia, and the lack of symptoms suggested the genetic nature of this case. The defect is probably a defective passage of iron between the cytoplasm and nucleus which renders the synthesis of haemoglobin faulty. In this way stippled cells are formed and these are more fragile than normal erythrocytes.

Experimental observations on iron turnover in the nuclei and cytoplasm of rabbit bone-marrow cells support this theory of a defect. No treatment is suggested for anaemias of this type.

H. Payling Wright

See also Section Pathology, Abstracts 2328 and 2357.

RETICULO-ENDOTHELIAL SYSTEM

2458. **The Pelger–Huet Anomaly.** (L'anomalia ereditaria di Pelger–Huet dei leucociti)
G. GRAMICCIA. *Haematologica* [*Haematologica*] **34**, 37–71, 1950. 11 figs., 44 refs.

Familial nuclear anomaly of leucocytes was first described by Pelger in Holland. Affected families have also been found in Switzerland, France, Germany, the United States of America, Japan, and China. This is the first report of the condition in an Italian family (of 23 members, 8 of whom were affected). Stab cells and metamyelocytes are more numerous in such persons and fully segmented polymorphonuclears are scanty. Monocytes and lymphocytes are normal. In the bone marrow there is also a slight shift to the left, but experiments involving phagocytosis by Pelger-cells show that they are functionally normal. Pelger's anomaly is transmitted as a dominant. Partial carriers of the characteristic features have been observed. In man, so far, it is not certain whether the anomaly has any pathological significance. The anomaly is not uncommon in rabbits and has been investigated by a number of workers.

E. Neumark

2459. **Histiomonocytic Reticulosis with Cutaneous Manifestations.** (Réticulose histio-monocytaire chronique avec manifestations cutanées)
X. VILANOVA and F. DE DULANTO. *Presse Médicale* [*Pr. méd.*] **82**, 1442–1444, Dec. 25, 1950. 8 figs., 12 refs.

A case of cutaneous reticulosis occurring in a male child aged 22 months is described. Areas of warm, hard infiltration appeared in the skin: they were covered with red- or violet-coloured skin and were associated with inguinal lymph-node enlargement. The first area involved was in the right lumbar region (6×8 cm.), the second, 2 weeks later, was on the right cheek, and the last, 9 weeks after the first, covered an area on the back between the two posterior axillary lines and was 12 cm. from top to bottom. These areas were not painful and there was a tendency towards central regression and peripheral extension. The area on the cheek showed prominent telangiectases. The liver was enlarged four fingerbreadths below the costal margin, being hard but not tender; the spleen could not be felt. Blood studies revealed an erythrocyte count of 3,500,000 per c.mm., haemoglobin was 70%, erythrocyte sedimentation rate (E.S.R.) 11 mm., leucocyte count 8,200 per c.mm.

with 1 to 2% of metamyelocytes and 7% of eosinophils in the differential count. A sternal-marrow examination showed reticulo-lymphatic hyperplasia. Many cells resembling histiocytes or monocytes were obtained on lymph node puncture, liver biopsy, and skin biopsy. The cheek lesion was treated with *x* irradiation (800 r) which caused disappearance of the lesion followed by skin atrophy. At the same time the lumbar lesion spontaneously disappeared. The patient also received some treatment with an organic arsenical preparation. When examined 2½ years after the onset he had no skin lesions; small shotty lymph nodes were present in the axillary and inguinal regions; the liver was enlarged two fingerbreadths and was tender; the spleen was not felt; there was a cough, and enlargement of the mediastinal lymph nodes was found. The haematological findings were similar to those observed previously. In the active stage biopsy material was inoculated into guinea-pigs and was examined by routine and special bacteriological methods with negative results. The authors consider this to be a case of chronic histiomonocytic reticulosis.

J. Maclean Smith

2460. **Morphological Study of Sternal Marrow in Patients with Extramedullary Malignant Tumours, with Particular Reference to Reticulo-endothelial Elements.** (Studio morfologico dello sternopuntato di portatori di neoplasmi maligni extramidollari con particolare riguardo agli elementi R.E.)

G. Lorusso. *Haematologica* [*Haematologica*] **34**, 93–146, 1950. Bibliography.

A series of 9 patients with carcinoma of the stomach, 8 with hepatic tumours, 4 with bronchial carcinoma, 1 with carcinoma of the breast with pulmonary metastases, 4 with lymphosarcoma, 2 with carcinoma of the kidneys, 1 with carcinoma of the ovaries, and 1 with extrinsic carcinoma of the larynx, were examined by blood counts and by marrow biopsy. Various ratios and indices were calculated from marrow findings. The red and white series of cells show slight maturation arrest, but the numbers of mitotic figures were slightly higher than normal, particularly as regards prophases of erythroblasts. These observations are due to, and depend on, toxic effects of necrosis in tumours, dyspeptic disturbances, loss of blood, metastases, and the effects of radiotherapy. Reticulo-endothelial cells numbered usually between 9 and 13 per 100 marrow cells, and plasma cells between 2 and 4%. *E. Neumark*

2461. **Hepatic Manifestations of Sarcoidosis and other Granulomatous Diseases. A Study Based on Histological Examinations of Tissue Obtained by Needle Biopsy of the Liver**

G. Klatskin and R. Yesner. *Yale Journal of Biology and Medicine* [*Yale J. Biol. Med.*] **23**, 207–248, Dec., 1950. 6 figs., bibliography.

Of 15 cases of established sarcoidosis, needle biopsy of the liver was positive in every instance and was the only histological proof in 12 of the 15 cases. In 5 other cases which, though unproven, were considered to be of classical sarcoidosis liver biopsy was negative.

Of the 15 cases, there was moderate hepatomegaly in 11 and splenomegaly in 6. The reactions to both strengths of P.P.D. tuberculin were negative in only 6. Liver function tests revealed minimal changes, which were thought to be due to the high serum globulin level of sarcoidosis rather than to liver damage. The positive biopsy specimens contained from 1 to 12 granulomata. In one case with jaundice there were numerous granulomata in the specimen, abnormal flocculation reactions, a prothrombin level of 50%, and an alkaline-phosphatase level of 56 Bodansky units, that is, a mixed parenchymal and obstructive syndrome.

The authors emphasize the non-specific histology of sarcoid granulomata and give details of similar hepatic lesions which they have found in cases of miliary and pulmonary tuberculosis, erythema nodosum, brucellosis, berylliosis, and virus and mycotic infections; they consider that a reticulum framework suggests sarcoidosis, while marked necrosis suggests tuberculosis or brucellosis. Epithelioid cells, lymphocytes, giant cells, and giant-cell inclusion bodies had no diagnostic significance, nor had the absence of necrosis or tubercle bacilli. They therefore advise that a histological diagnosis of sarcoidosis, based upon a liver biopsy, should be reviewed against the clinical background. Typical "sarcoid" lesions were also found in 5 patients with jaundice or hepatomegaly who were not suffering from sarcoidosis or other conditions known to cause similar changes; their case histories are given and possible explanations discussed.

The authors encountered these various granulomata in a series of 650 needle biopsies of the liver obtained by the Vim–Silverman technique through the intercostal route, with no fatalities and only a few minor complications.

[This excellent paper with its numerous instructive case histories should be read in full by those interested in these granulomata.] *Richard Terry*

2462. **Naphthylamine Compounds in Treatment of Severe Disorders of the Blood and Lymphatic System.** (I composti naftilaminici nella terapia di alcune gravi emolinfopatie)

P. Spigliati. *Minerva Medica* [*Minerva med., Torino*] **2**, 490–497, Sept. 22, 1950. 6 figs., 4 refs.

In 7 out of 8 cases of Hodgkin's disease treated with naphthyl bis-(β-cholorethyl)-amine the lymph nodes diminished in size and became more discrete, the erythrocyte count rose slowly and the leucocytes were not seriously affected even by prolonged treatment. In 2 cases of chronic myeloid leukaemia treated similarly the erythrocyte count rose slowly, the leucocyte count diminished, and those found in the blood were more mature, but marrow changes were inconclusive. No real changes were noted in 2 cases of acute myeloid leukaemia. Pyrexia often disappears with treatment and patients feel better. In one case of leukaemia which had become radio-resistant, naphthylamine induced renewed radiosensitivity. After treatment of Hodgkin's disease, reticulum-cell hyperplasia diminishes and Sternberg–Reed cells disappear, but eosinophils remain numerous.

E. Neumark

Respiratory Diseases

2463. **Minor Respiratory Infections. The Importance of their Diagnosis and Treatment**
D. G. WRAITH. *British Journal of Tuberculosis* [*Brit. J. Tuberc.*] **45**, 15—21, Jan., 1951. 10 figs., 24 refs.

Abnormal transient radiographic lung shadows were discovered in 68 persons among 38,346 subjected to routine mass radiography. They were all young male adults in the age-group 21 to 25 years. Physical signs in the chest were found in 31 cases. The most common sites for the abnormal shadows were the lower zone of right lung (29 cases), and the upper zone of the left lung, (11 cases). There were three main elements which existed together in various proportions or separately: a homogeneous, ill-defined shadow of light density; increase in size and density of the normal lung markings; and a mottled appearance due to the presence of very small, dense, scattered opacities. The association of emphysema with these small opacities suggested that the latter might be areas of collapse. Some definite evidence of collapse of part of a lobe was present in at least 14 cases and abnormal shadows were seen in the upper zones; 21 cases showed a great resemblance to pulmonary tuberculosis. The average duration of the very mild symptoms such as shivering, anorexia, soreness in the chest, headache, and " feeling off colour " was 28 days.

The duration of symptoms was one week in 23 patients, less than one week in 16, and from 3 to 6 weeks before examination in 11 patients.

It is suggested that breathing exercises are a most important form of treatment to prevent residual damage.

Kenneth Marsh

2464. **Intrapleural Pressures and Artificial Pneumothorax in Atelectatic Bronchiectasis**
A. W. LEES. *Glasgow Medical Journal* [*Glasg. med. J.*] **32**, 1–12, Jan., 1951. 5 figs., 24 refs.

Working at Ruchill Hospital, Glasgow, the author studied the intrapleural pressure readings, at the induction of artificial pneumothorax, in 100 patients with uncomplicated pulmonary tuberculosis. The average readings were −7, −3·1 cm. of water. In 20 male patients aged 5 to 35 years, without clinical or radiological evidence of intrathoracic disease, the average readings were −7·3, −3·84 cm. of water.

In 5 cases of chronic lower-lobe bronchiectasis with marked dilatation of bronchi in the collapsed lobe, the intrapleural pressure readings on the side of the collapse were: −6, −4; −5, −3; −8, −4; −5, −3; −7, −5 cm. of water. The author compares these figures with the low intrapleural pressure recorded by other workers in cases of pulmonary collapse. It was thought that intrapleural pressure might have been low when the collapse had first occurred, but that subsequent loss of lung elasticity, and, to some extent, bronchial elasticity, had been responsible for return of the pressure to normal levels. During an investigation into the incidence of pulmonary collapse in whooping-cough a case of recent left lower-lobe collapse was observed in which the readings were −8, −5 cm. of water on the left side and −5, −3 cm. of water on the right side. It is suggested that when only part of the lung collapses the intrapleural pressure does not give a true measure of the severity of the stretching forces acting on the collapsed portion of the lungs indicating only the average elastic tension of the lung; if the tension in the collapsed portion is greater than that in the rest of the lung, the bronchi in the collapsed lobe might be dilated without marked lowering of the intrapleural pressure.

If the mechanical forces producing the bronchial dilatation could be abolished by artificial pneumothorax, and any supervening infection countered by appropriate chemotherapy, residual bronchial dilatation would be less likely in the event of the atelectatic area re-expanding. The experiment was tried in 3 cases of recent lobar collapse after whooping-cough. Re-expansion occurred in all 3 cases, so no conclusions could be drawn as to the value of artificial pneumothorax therapy, though in one case its induction produced immediate improvement in the severe cough and sputum production, with marked reduction in the bronchial dilatation.

An artificial pneumothorax was induced in 5 cases of lower-lobe atelectatic bronchiectasis of long standing. The induction readings in all 5 cases were within normal limits, and no pleural adhesions were encountered. Even when the lung was almost completely relaxed by artificial pneumothorax no appreciable difference in the degree of bronchial dilatation was observed. The author discusses the possible value of artificial pneumothorax therapy in determining whether or not dilated bronchi in a collapsed lobe are so little damaged that they would return to their normal calibre if re-expansion of the lobe occurred.

J. M. Alexander

2465. **The Blood Flow through an Atelectatic Lung**
V. O. BJÖRK and E. F. SALÉN. *Journal of Thoracic Surgery* [*J. thorac. Surg.*] **20**, 933–942, Dec., 1950. 6 figs., 6 refs.

The authors produced acute atelectasis in the dog by introducing a Carlen's double-lumen bronchospirometry catheter and sucking off all the air from the right lung. Atelectasis was confirmed radiologically and the blood flow through the lungs was then investigated by angiocardiography. The arterial oxygen saturation was also determined. Chronic atelectasis was produced by ligation of all the bronchi to the right lung at thoracotomy; similar investigations were made at intervals of 3 days to 8 months afterwards. In an acute atelectasis the pulmonary arteries do not become smaller, and the capillary bed remains open, as indicated by simultaneous filling with contrast medium of pulmonary arteries and veins on both sides. The arterial oxygen deficit is approximately equal to that present when the same lung

breathes 100% nitrogen. The blood flow through an atelectatic area becomes progressively less during the first month until practically no blood is passing through, but there is no decrease in size of the main branches of the corresponding pulmonary artery.

In a long-standing atelectasis the pulmonary artery is somewhat reduced in size and the blood flow is found to be much slowed or even arrested. It is assumed that the capillaries have closed down in the same way as in a resting part of an organ. *F. J. Sambrook Gowar*

2466. **Nonspecific Pneumonitis of the Left Upper Lobe (Simulating the "Middle Lobe Syndrome" and Producing an Early Superior Pulmonary Sulcus Syndrome). Report of Case**
W. M. ASHE, J. R. MCDONALD, and O. T. CLAGETT. *Journal of Thoracic Surgery* [*J. thorac. Surg.*] **21**, 1–6, Jan., 1951. 5 figs., 5 refs.

A single case is described and is worthy of record for the reasons given in the title. A pregnant woman of 33 developed pain in the left shoulder and arm following a cough. She had a swelling above the clavicle, but Horner's syndrome was not present. An x-ray examination of the chest showed a dense, rounded shadow in the left upper lobe; bronchoscopy was negative. The findings at thoracotomy, like those at *x*-ray examination, suggested a malignant neoplasm. Upper lobectomy was performed. Examination of the specimen, however, revealed a dense fibrous mass with chronic inflammatory changes and enlarged hilar lymph nodes—resembling the so-called "middle lobe syndrome".

Although this case did not show all the features of the superior sulcus syndrome as described by Pancoast, several of them were present, disproving the contention that this syndrome is pathognomonic of malignant disease.

[The symptom of persistent pain of brachial-plexus distribution associated with inflammatory lesions of the lung is not uncommon.] *M. Meredith Brown*

2467. **Pneumococcal Pneumonia at Jefferson Hospital**
C. T. DE BERADINIS and A. M. DE ANDINO. *American Journal of the Medical Sciences* [*Amer. J. med. Sci.*] **221**, 1–4, Jan., 1951. 1 fig., 6 refs.

A group of 75 cases of pneumococcal pneumonia, treated in the Jefferson Hospital between the years 1937 and 1940, are compared with a similar group of 91 cases treated between 1946 and 1949. Group (1) constituted 1·06% of all ward admissions and Group (2) 1·05%.

In recent years there has been a marked increase in the higher-numbered bacteriological types of pneumococci and a decrease in the lower-numbered types, especially Type I. The number of patients above the age of 50 in Group (1) was 26·6% compared with 47·2% in Group (2). The typical signs of lobar consolidation were found in 84% of cases in Group (1) and in only 27·1% in Group (2). Purulent complications occurred less frequently in the second group (7·7% compared with 16%) but the mortality of these (50%) was the same in both groups. In Group (1) there were 16 deaths, a mortality rate of 21·3%, but in 1939, after the introduction of sulphonamides, the mortality rate fell to 5%. In Group (2), in which all the cases were treated with penicillin, there were 6 deaths, a mortality of 6·5%.

In Group (2) all the patients who died were over the age of 40 and it is considered that, despite the advent of antibiotics, the presence of complicating degenerative disease after the age of 40 is still of important prognostic significance. *A. Gordon Beckett*

2468. **Atypical Pneumonia**
C. H. STUART-HARRIS. *British Medical Journal* [*Brit. med. J.*] **2**, 1457–1461, Dec. 30, 1950. 4 figs., 37 refs.

2469. **Primary Atypical Pneumonia**
S. P. BEDSON. *British Medical Journal* [*Brit. med. J.*] **2**, 1461–1463, Dec. 30, 1950. 22 refs.

2470. **Treatment of Primary Atypical Pneumonia in Children with Aureomycin. Report of Nineteen Cases**
C. E. ANDERSON. *American Journal of Diseases of Children* [*Amer. J. Dis. Child.*] **80**, 533–540, Oct., 1950. 3 figs., 6 refs.

2471. **An Evaluation of Aureomycin Therapy in Primary Atypical Pneumonia**
E. B. SCHOENBACH, A. SWEED, B. TEPPER, and M. S. BRYER. *New England Journal of Medicine* [*New Engl. J. Med.*] **243**, 799–806, Nov. 23, 1950. 1 fig., 12 refs.

The results of treatment of primary atypical pneumonia with penicillin or sulphonamides in 22 patients and with aureomycin alone in 33 patients are compared. Similar diagnostic criteria were used and the groups were roughly comparable in age, sex, and severity of the disease. The dosage of aureomycin varied considerably, but was most frequently 250 mg. each hour for 3 to 4 doses, followed by 250 mg. every 2 hours for the ensuing day, then 250 mg. every 4 to 6 hours for several days. The average duration of fever in hospital was $6{\cdot}4 \pm 0{\cdot}85$ days in the first group and $3{\cdot}1 \pm 0{\cdot}07$ days for the aureomycin-treated patients ($1{\cdot}8 \pm 0{\cdot}23$ days after the beginning of aureomycin therapy). *J. W. Litchfield*

2472. **Chondromatous Hamartoma of the Lung**
C. J. CARLSEN and W. KIAER. *Thorax* [*Thorax*] **5**, 283–292, Dec., 1950. 5 figs., 31 refs.

The authors discuss 9 cases of benign cartilaginous hamartoma of the lung, chiefly from the clinical and radiological aspects. The characteristic structure of masses of cartilage associated with connective and adipose tissue and epithelial clefts is described. All 9 specimens were from adults, aged from 48 to 72 years. The growth was found during routine *x*-ray examination of the lung in 5 cases, accidentally at bronchoscopy in 1 case, and was found incidentally at necropsy in 3 cases. *R. A. Willis*

2473. **Spontaneous Pneumothorax from Secondary Sarcoma of the Lung**
A. B. SHAW. *British Medical Journal* [*Brit. med. J.*] **1** 278–280, Feb. 10, 1951. 1 fig., 9 refs.

Digestive Disorders

STOMACH AND DUODENUM

2474. **A Therapeutic Experiment in Peptic Ulcer**
J. B. STOLTE. *Lancet* [*Lancet*] **2**, 858–859, Dec. 23, 1950. 23 refs.

Since 1944 " robuden " has been popular in Switzerland for the ambulatory treatment of peptic ulcer. It consists of watery extracts of the stomach and intestine of newly-killed animals. It can be given by injection or by mouth: in the case of the injection there are different preparations for gastric and duodenal treatment. Similar preparations have been used previously and the author reviews the literature.

He gave 23 patients with gastric, and 26 with duodenal ulcer a course of injections and tablets, there being no restriction on activity, diet, or smoking; 24 with gastric and 28 with duodenal ulcer were given placebos of physiological saline injections and inert tablets. Of the duodenal-ulcer cases 93% were symptom-free or greatly improved after injections of robuden, and 70% after the tablets. The figures for the gastric-ulcer cases so treated were 78% and 60% respectively. For those treated with placebo the corresponding figures were 78% and 68%; 78% and 83%. One patient was convinced he got greater relief from the inert tablets than from robuden. Repeated radiographs were taken of all the patients before treatment, after its completion and again either 6 or 12 weeks later. Following robuden 20 of the 23 with gastric ulcer showed a marked *x*-ray improvement, but 21 of the 24 with gastric ulcer treated with placebos also showed equal *x*-ray improvement.

The author draws the conclusion from these figures that this acclaimed new remedy for peptic ulcer is no more efficacious than a placebo.

[This paper is well written and concise. Again attention is drawn to the great difficulty of assessing the value of any therapy in any condition in which spontaneous remissions occur and psychological factors influence the severity of symptoms.] *M. H. Pappworth*

2475. **Management of Massive Hemorrhage from Gastroduodenal Ulceration**
W. F. LIPP, M. H. LIPSITZ, E. MILCH, and A. H. AARON. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 14–16, Jan. 6, 1951. 2 refs.

Of 274 cases of haematemesis in Buffalo General Hospital between 1938 and 1949, 101 were classified as cases of " massive " haemorrhage of less than one week's duration, showing the classical signs of collapse with an erythrocyte count below 2,500,000 per c.mm. The authors found that the mortality for such cases had fallen from 25% in 1938 to 1943 to 8·2% in 1944 to 1949; they consider that the deciding factor in this improvement was the more liberal use of blood transfusion. They stress the adverse effect of age on prognosis (only one of the 15 patients who died was under 48) and of coincident disease.

In considering the vexed question of the selection of cases for emergency surgery they suggest a transfusion test. In this they give up to 2 litres of blood per hour for the first 3 hours in cases of severe collapse. If at the end of this time there is no appreciable improvement, as shown by a rise in blood pressure, falling pulse rate, and disappearance of air hunger, they advocate immediate operative intervention. If under this regimen there is improvement they continue transfusion for a further 3 hours and then stop it and observe the patient carefully. At any indication of further massive haemorrhage transfusion is restarted and operation carried out.

The authors point out that while such general rules are of value, each case must be judged individually; to carry out emergency partial gastrectomy demands the constant availability of a highly skilled surgical team.

T. D. Kellock

2476. **Massive Upper Digestive Tract Hemorrhage of Undetermined Origin**
I. R. JANKELSON and L. R. MILNER. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 17–21, Jan. 6, 1951. 10 refs.

The authors describe 27 patients admitted to the Boston City Hospital with massive haemorrhage from the upper digestive tract in whom no cause for the bleeding could be found at the first hospital admission in spite of all the normal investigations. The incidence of such cases at the hospital was 5% of all cases of haemorrhage. All patients were followed up for periods varying between 2 and 12 years. In this series there were 15 males and 12 females and their ages ranged from 13 to 65 years, the majority being in the fourth and fifth decades. In all, they had 66 haemorrhages between them, but 14 haemorrhages had occurred before the initial admission. The degree of the first observed haemorrhage varied, but in all the pulse rate was raised and the blood pressure low. Radiographs were taken in all cases at least once at the time of the first observed haemorrhage and a variety of other investigations were carried out.

After follow-up, a diagnosis was established in 11 cases (2 cases each of gastric ulcer, duodenal ulcer, and chronic hypertrophic gastritis, and one each of carcinoma of the stomach, carcinoma of the liver (probably arising from the bile duct), cirrhosis of the liver, diaphragmatic hernia, and haemangioma of the jejunum). The stomach in hypertrophic gastritis showed multiple fissures on gastroscopy. Laparotomy was carried out in 5 cases but a diagnosis was made thereby in only 2. In one case laparotomy was carried out 4 times without any cause for the bleeding being discovered, and eventually a para-oesophageal hernia was found. Thus in spite of intensive investigations for a number of years the cause in 16 of the original 27 cases remained undiagnosed.

The authors recommend medical management for a first haemorrhage of undetermined origin and surgical exploration for a recurrence.

[The authors make no recommendations for reducing the number of undiagnosed cases but their findings support the case for early radiological investigation, as suggested by Elmer, Rousuck, and Ryan (*Gastroenterology*, 1950, **16**, 552): they do not mention the value of early gastroscopy in detecting acute gastric ulcer.]

T. D. Kellock

2477. **Role of Transfusions in the Management of Gastric Hemorrhage**

H. M. POLLARD and A. WOLLUM. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 22–26, Jan. 6, 1951. 20 refs.

The authors discuss the theoretical disadvantages of early transfusion and the possibility of preventing clot formation by raising the blood pressure.

A review is given of 108 cases of bleeding peptic ulcer admitted to the University Hospital, Ann Arbor, Michigan, between 1943 and 1949. Of these, 59 cases were not transfused at all, and although the majority of them were mild cases of haemorrhage, 12 were classified as severe (haemoglobin below 7·8 g. per 100 ml., erythrocyte count below 2,500,000 per c.mm., and haematocrit reading below 30%).

The authors find a higher incidence of further haemorrhage and a higher mortality rate among the transfused even in the cases of severe haemorrhage. They regard as specific indications for transfusion a systolic blood pressure below 90 mm. Hg with signs of shock, and a fall in haemoglobin value to 50%. A value of 50% is regarded as a critical one, and in any case in which the value is lower a further haemorrhage may prove fatal.

The prognostic factors considered to be unfavourable are: age over 45, a first haemorrhage, haematemesis rather than melaena, haemorrhage persisting over 24 hours after admission, haemorrhage occurring while the patient is following a full medical ulcer regimen, and coexisting complicating disease.

Patients showing any of these factors (except the last), should be considered candidates for emergency operation and should receive blood in sufficient amount to keep them fit for surgery. In other cases the authors feel that cautious withholding of blood during the first few hours after the onset of haemorrhage (unless shock develops), may favour clot formation and cessation of bleeding.

T. D. Kellock

LIVER

2478. **Liver Steatosis in Undernourished Chilean Children. I. Its Evolution as Followed by Serial Puncture Biopsies**

J. MENEGHELLO, H. NIEMEYER, and J. ESPINOSA. *American Journal of Diseases of Children* [*Amer. J. Dis. Child.*] **80**, 889–897, Dec., 1950. 2 figs., 15 refs.

The authors studied the state of the liver of grossly undernourished Chilean children suffering from a syndrome similar to the "malignant malnutrition" of Africans. They performed 253 biopsies on 92 children, nearly all aged 12 to 30 months, using the Vim–Silverman needle by the subcostal route. There were no complications other than occasional "gaseous distension". [The size of the liver is not mentioned.]

They discuss 63 of these 92 children, all of whom had fatty livers and from whom 164 biopsies were taken. The fat was present in four grades: grade I, gross amounts, with large drops filling the whole cell; grade II, moderate amounts, with drops of all sizes; grade III, slight amounts, with only small droplets; and grade IV, with negligible amounts. Other histological changes are also described. In nearly all cases, grade-I fatty change was found on first admission to hospital. Improvement to grade II was reached in 10 to 20 days and to grade III in 20 to 30 days. Most patients discharged clinically well were in this third grade. Contrary to the findings of other workers, the present authors believe that a pronounced degree of fatty change is not necessarily linked with a bad prognosis.

[For several obvious reasons this interesting paper is unlikely to be duplicated in Britain.]

Richard Terry

2479. **Liver Steatosis in Undernourished Chilean Children. II. Study on Some Liver Function Tests**

H. NIEMEYER and J. MENEGHELLO. *American Journal of Diseases of Children* [*Amer. J. Dis. Child.*] **80**, 898–904, Dec., 1950. 1 fig., 25 refs.

The authors continued their investigation of fatty livers by carrying out 53 needle biopsies of the liver and simultaneous flocculation tests on 31 children. The flocculation tests used were the scarlet red, the colloidal gold, the cephalin–cholesterol, and the thymol turbidity. Each grade of fatty change (see Abstract 2478) was associated with all degrees of normal and abnormal flocculation and no correlation existed: neither was a correlation found with a smaller number of sugar tolerance tests.

[Several recent articles have reported the same findings with the addition that bromsulphalein excretion is frequently abnormal in fatty infiltration of the liver.]

Richard Terry

2480. **Liver Steatosis in Undernourished Chilean Children. III. Evaluation of Choline Treatment with Repeated Liver Biopsies**

J. MENEGHELLO and H. NIEMEYER. *American Journal of Diseases of Children* [*Amer. J. Dis. Child.*] **80**, 905–910, Dec., 1950. 2 figs., 16 refs.

The authors, who in a previous paper (*Amer. J. Dis. Child.*, 1949, **78**, 141) discussed their inability to reproduce the good response of fatty liver to desiccated hog's stomach and choline described by others, further investigated the value of choline in the treatment of the undernourished children described in Abstracts 2478–9. From 2 to 8 liver biopsies were performed on each of 41 children, all of whom had grade-I fatty livers, during treatment with a high-protein diet. Choline, 5 g. by mouth daily, was given to 23 of the children, while the remaining 18 served as controls.

The results showed a more rapid disappearance of fat from the choline-treated group than from the controls. Approximately 50% of the former group improved successively to grades II, III, and IV by the 10th, 20th, and 30th days respectively, whereas the control group reached the same grades 10, 15, and 25 days later respectively. Choline apparently had no effect on the end-results, for there was no significant difference in the two groups after 50 days.

[It is doubtful whether liver sampling by needle biopsy is accurate enough to permit such definite conclusions without using a much larger series.] *Richard Terry*

2481. **Liver Biopsy. Correlation with Clinical and Biochemical Observations**

J. H. MOYER and O. A. WURL. *American Journal of the Medical Sciences* [*Amer. J. med. Sci.*] **221**, 28–37, Jan., 1951. 33 refs.

The authors describe their experience in 200 biopsy examinations of the liver by the Vim–Silverman needle technique. There were 8 failures, 7 of which occurred while they were still using the subcostal approach, which they later abandoned for the mid-axillary intercostal route.

Cirrhosis was confirmed in 23 out of 30 patients with well-marked evidence of portal cirrhosis, but in the other 7 fatty metamorphosis only was found. Bromsulphalein excretion, which proved the most useful liver function test, was usually abnormal in both groups, whereas flocculation reactions were abnormal only in the patients with cirrhosis. In 2 cases of clinical viral hepatitis of 5 days' duration, without preceding symptoms of liver disease, advanced cirrhosis was found. These 2 cases are reported as good examples of the possible fallacy of assuming previous attacks of jaundice to be viral, especially in relation to the sequelae of viral hepatitis and to the aetiology of cirrhosis. No evidence of cirrhosis was found in 5 instances of hepatomegaly in long-standing heart failure, the biopsy specimen being taken during remission. In 6 patients with proven sarcoidosis, liver biopsy was positive in 5.

The authors attribute one death to needle biopsy. Intra-abdominal haemorrhage occurred on the 4th day after biopsy and the patient died during laparotomy. At necropsy no source of bleeding was found and the biopsy wound in the liver was well organized; the immediate cause of death was coronary occlusion.

Richard Terry

2482. **Comparative Studies of "Liver Tests" and Electrophoretic Analyses of Serum Proteins in Portal and Biliary Cirrhosis**

W. E. RICKETTS and K. STERLING. *American Journal of the Medical Sciences* [*Amer. J. med. Sci.*] **221**, 38–45, Jan., 1951. 1 fig., 33 refs.

The authors carried out liver function tests and electrophoretic analysis of serum proteins on 66 patients with portal cirrhosis and 48 with biliary cirrhosis due to obstruction or infection. The tests included estimation of alkaline phosphatase, total cholesterol, cholesterol esters, prothrombin level after administration of vitamin K, and cephalin–cholesterol flocculation in the serum, hippurate excretion, serum albumin : globulin ratio, and thymol turbidity tests. The results showed the usual parallelism between depth of jaundice and the abnormality of the findings in cases of portal cirrhosis, but no such parallel in cases of biliary cirrhosis, suggesting that the damage after obstruction and infection is usually confined to the portal triads.

The electrophoretic patterns of serum proteins were nearly normal in both types of cirrhosis with little clinical or laboratory evidence of active hepatic disease, but abnormal patterns were invariably found in advanced disease, including reduction of albumin and increase of gamma globulins in both groups. The patterns in biliary cirrhosis were also remarkable for the steep and often "spectacular" beta-globulin peaks, considered to be due to increased beta-lipoprotein.

Richard Terry

2483. **Biochemical Changes in Diseases of the Biliary Tract.** (Alteraciones bioquimicas en las enfermedades de las vias biliares)

C. JIMÉNEZ DIAZ and H. CASTRO MENDOZA. *Revista Clinica Española* [*Rev. clin. esp.*] **39**, 307–317, Dec. 15, 1950. 26 figs.

The authors have studied the biochemical changes arising from lesions of the biliary tract, both in experimental animals and in man. They point out that these changes are of interest in two ways. They are the basis of tests employed in the differential diagnosis of jaundice. and are also of value in research into other conditions where there may be interference with liver function. Estimation of the bile pigments is not of diagnostic value, except perhaps during the course of a long-continued biliary obstruction, when a fall in their level in the blood, unaccompanied by clinical improvement, may be an early sign of hepatic failure.

Alkaline phosphatase values rise early and steeply in biliary obstruction, whether experimental or in disease. Figures of 70 units are attained, but the average lies between 20 and 60 units (normal 2 to 8). In hepatitis the value is usually over 10 and averages 18·9 units. In cirrhosis the value depends on the degree of jaundice and liver damage, but more than half the cases showed a value within normal. The blood cholinesterase value usually falls in hepatitis and cirrhosis; in obstruction it falls initially and recovers. A normal value probably indicates that jaundice is unaccompanied by liver damage, but a falling level does not indicate onset of damage. Cholinesterase is supposed by some to be formed only in the liver.

In 120 normal people values lay between 250 and 400 units with very little scatter. In cases of hepatitis and cirrhosis there was a marked fall in level and the authors consider that, taken with the alkaline phosphatase level, it is of great value in assessing liver damage. Ligation of the bile duct in animals causes an early rise in the lipid content of the blood followed by a return to normal, except in cases of partial ligation where the value continues to rise. In disease of the liver the value remains constant at first, then slowly falls, so that by the 3rd or 4th week there is a significant change. If there is

obstruction the value behaves much as it does in experimental animals. The estimation is of value, therefore, in cases of long-standing jaundice, but not in early cases.

Changes in the blood protein level are of value in estimating the amount of liver involvement in early cases of jaundice, particularly if the tests described by MacLagan and Kunkel are used. Normal values are usually obtained in controls and in cases of biliary obstruction, but there is a marked fall when there is liver damage. The urinary urobilinogen level is significantly raised in hepatic damage and lowered slightly in obstruction, a difference which is of great value in diagnosis. There must, of course, be bile in the faeces. The prothrombin time has no diagnostic value, and the determination of urinary choline does not give results worth the trouble. The authors conclude that clinical skill is the most important factor in solving the problems set.

J. G. Jamieson

2484. **Vascular Disorders in Liver Disease.** (Zaburzenia naczyniowe w przebiegu chorób wątroby)
W. MARKERT. *Polskie Archiwum Medycyny Wewnetrznej* [*Polskie Arch. Med. wewn.*] **20**, 242–244, 1950.

The frequency with which patients suffering from infective hepatitis complained of tiredness, ocular pains, and persistent severe headaches drew the author's attention to vascular changes in the optic fundi. Routine examination often revealed venous congestion, arteriospasm, and mild degrees of papilloedema. These vascular changes were unrelated to the degree of jaundice or impairment of renal function. They were particularly frequent in ambulant cases of infective hepatitis without apparent jaundice. *J. T. Leyberg*

2485. **Clinical and Experimental Studies of the Treatment of Chronic Hepatitis and Cirrhosis of the Liver with Intravenous Liver Extracts.** (Ricerche clinico-sperimentali sulla cura delle epatiti croniche e delle cirrosi con estratti epatici introdotti per via endovenosa)
M. SCHIAVINA and G. MAURO. *Minerva Medica* [*Minerva med., Torino*] **2**, 1239–1244, Dec. 15, 1950. 30 refs.

It is known that certain liver extracts are able to protect the liver against toxic agents such as carbon tetrachloride, and a highly potent extract named "hepatoven" has been prepared for clinical use. This substance, which is given intravenously, is not without disadvantages, however, in that toxic effects such as tachycardia, vasodilatation, epigastric discomfort, and nausea and vomiting may be severe enough to interfere with treatment, as in 3 of the present series of patients. The addition of 1 g. *para*-aminobenzoic acid is said to prevent such reactions.

Hepatoven has been given to 11 patients with varying degrees of hepatitis and cirrhosis, in doses which are increased daily from 1 ml. to 10 ml., followed by twice-weekly injections for several weeks. Good results were judged by subjective improvement, often marked in patients who had had symptoms for many years, by diuresis and a decrease in ascites, by the disappearance of jaundice, and by improvement in liver function. The impression from this small series has been that patients with early cirrhosis (4 cases) and those in whom liver damage persists after an attack of acute hepatitis are definitely improved, whereas those with established cirrhosis (small liver, ascites, and other evidence of portal obstruction) do not respond. Two patients with early cirrhosis are back at work and symptom-free a year and 18 months respectively after treatment. The authors believe that the extract exerts its protective action by inhibiting an anti-diuretic factor responsible for the clinical syndrome of cirrhosis. *A. Paton*

2486. **A Study of Pyruvic Acid in the Blood and Spinal Fluid of Patients with Liver Disease with and without Hepatic Coma**
D. S. AMATUZIO and S. NESBITT. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1486–1490, Nov., 1950. 4 figs., 11 refs.

Working at the Department of Medicine, Minnesota University, and the Minneapolis Veterans Administration Hospital, the authors studied the pyruvic acid levels in blood and cerebrospinal fluid of 16 surgical and orthopaedic patients and of 31 patients with diseases other than those of the liver, 13 patients with pulmonary emphysema, and 35 patients with hepatic disease, of whom 12 had virus hepatitis and 23 had decompensated portal cirrhosis. All patients were at rest in bed, and had a 3,000-Calorie diet fully supplemented with vitamins: 7 patients with portal cirrhosis and 5 with homologous serum hepatitis were comatose and received their diet by gastric intubation. In the control surgical patients, the fasting blood and cerebrospinal-fluid pyruvic acid levels were $1{\cdot}04 \pm 0{\cdot}088$ and $1{\cdot}02 \pm 0{\cdot}003$ mg. per 100 ml. respectively. The group of patients with non-hepatic diseases gave figures which were not significantly different, as did the members of the group with viral hepatitis who were not severely ill or in coma. On the other hand, 15 patients with decompensated portal cirrhosis showed a mean fasting blood pyruvic acid level of $1{\cdot}54 \pm 0{\cdot}23$ mg. per 100 ml., which was significantly increased over the level in the control group. Where the blood pyruvic acid level was followed up in these patients it was found to return to normal in 4 to 5 days. The 12 patients in coma, who all had markedly deranged liver function, showed a mean fasting blood pyruvic acid level of $2{\cdot}65 \pm 0{\cdot}963$ mg. per 100 ml. while the spinal fluid pyruvic acid level was $1{\cdot}53 \pm 0{\cdot}597$ mg. per 100 ml., both values being significantly higher than in the control group. The blood pyruvic acid level increased as patients went into coma.

Decreased arterial oxygen saturation had no effect on the blood pyruvic acid level. The mean blood pyruvic acid level in non-comatose cases of viral hepatitis was significantly lower than in patients with portal cirrhosis and patients with coma, while the blood level in cases of portal cirrhosis was significantly lower than in cases of coma. *Walter H. H. Merivale*

See also Section Pathology, Abstracts 2340; Section Medicine: General, Abstract 2412; and Section Disorders of the Blood, Abstract 2461.

Endocrine Disorders

2487. **Mild Cushing's Syndrome due to Aspirin**
J. B. COCHRAN, R. D. WATSON, and J. REID. *British Medical Journal* [*Brit. med. J.*] **2**, 1411–1413, Dec. 23, 1950. 3 figs., 6 refs.

The case is reported of a girl aged 13 years suffering from her third attack of rheumatic fever with cardiac involvement and a temperature of 104° F. (40° C.). She was treated with aspirin in doses up to 5 g. daily. During treatment her face became rounded and " puffy " but not oedematous, acne appeared on the forehead, chest, shoulders, and back, and she became morose. The urine contained a reducing sugar and there was a mild diabetic type of sugar tolerance curve. Water and chlorides were retained and there was a negative nitrogen balance. The serum albumin : globulin ratio recovered from its original reversed state, and plasma fibrinogen level also fell to normal on reducing the dose of aspirin.

The authors regard these symptoms as manifestations of mild Cushing's syndrome which gradually subsided as the aspirin dosage was reduced. They consider them to be the result of aspirin treatment, compare them with the similar results obtained with cortisone, and discuss possible modes of action. *A. C. Crooke*

2488. **17-Ketosteroid Excretion in the Diagnosis of Endocrine Dysfunction**
W. R. BUTT, A. S. MASON, and C. J. O. R. MORRIS. *Lancet* [*Lancet*] **2**, 894–896, Dec. 30, 1950. 2 figs., 23 refs.

Working at the London Hospital and using the polarographic method of determination, the authors have studied the 17-ketosteroid excretion of 235 patients with endocrine dysfunction.

Group (1) consisted of patients with adrenal cortical hyperfunction, with virilism or obesity resembling that of Cushing's syndrome. Usually, but not invariably, an increase occurred in 17-ketosteroid output corresponding to the degree of virilism; simple hirsutism alone did not appear to be related to increased output. In conditions resembling Cushing's syndrome, however, there was no relation between the severity of the disturbance and the 17-ketosteroid excretion. Group (2) consisted of patients suffering from cortical failure, in whom a decreased excretion of 17-ketosteroids would be expected. In 7 verified cases of Addison's disease and in 9 cases of primary pituitary failure a strikingly low output of 17-ketosteroids was observed (less than 3 mg. in the 24 hours); in primary testicular failure there was a far less marked fall in 17-ketosteroid excretion.

In various miscellaneous endocrine disorders, dwarfism, pituitary tumours, and thyrotoxicosis the androgen output could not be related to the clinical findings.

The authors point out that factors other than endocrine disturbances, such as age, chronic illness, malnutrition, and impairment of liver function influence the 17-ketosteroid excretion, thereby reducing its value as a diagnostic test. The test is reliable in adrenal failure, either primary or due to pituitary failure, and of some value as an indication of adrenal hyperfunction in cases of virilism; in other endocrine diseases no reliance can be placed upon it as a diagnostic aid. *Nancy Gough*

2489. **Radioactive Iodine Uptake in the Hypermetabolism of Acromegaly**
E. P. MCCULLAGH, A. GOLD, and J. B. R. MCKENDRY. *Journal of Clinical Endocrinology* [*J. clin. Endocrinol.*] **10**, 687–691, July, 1950. 1 fig., 11 refs.

Oral doses of 100 to 400 millicuries of radioactive iodine were given to 7 patients with acromegaly whose basal metabolic rate ranged between +16% and +53%. The proportion of the dose collected in the thyroid within 2 hours was measured. Only 6 to 40% of the administered dose was collected and the proportion collected bore no relation to the level of the basal metabolism; all these values are within the range of values obtained with normal persons, and only the highest value overlapped the lowest value observed among 18 cases of hyperthyroidism.

It is concluded that the hypermetabolism that is present in about half of the cases of acromegaly is not due to thyroid stimulation. A direct effect of some pituitary secretion on metabolic rate is suggested. *Peter C. Williams*

THYROID AND PARATHYROID GLANDS

2490. **Hyperthyroidism of Diencephalo-pituitary Origin.** (Les syndromes de Basedow d'origine diencéphalo-hypophysaire)
L. DE GENNES, H. BRICAIRE, I. BENZECRY, and J. VILLIAUMEY. *Presse Médicale* [*Pr. méd.*] **59**, 41–46, Jan. 17, 1951. Bibliography.

The authors contend that hyperthyroidism is due primarily to a disturbance in the diencephalo–hypophysial region; clinical and experimental evidence for this view is discussed, and 7 cases are described in support. All the patients were women; in one, carbon monoxide poisoning was followed by quadriplegia and Parkinsonism, and 3 years later hyperthyroidism, acromegaly, and obesity of the face and trunk developed simultaneously. Another patient complained of tachycardia, tremor, and nervousness at the age of 14; after thyroidectomy, which was repeated twice, she lost weight and exophthalmos developed, with a rise in basal metabolic rate (B.M.R.). Four patients became ill at or near the menopause; the 7th patient had had a bilateral ovariectomy 20 years before. None of these obtained a remission with antithyroid compounds alone, but 2

responded to oestrogen administration, one (temporarily) to thyroxine, and one to *para*-oxypropiophenone, a compound claimed to have an inhibitory effect on the anterior pituitary. In 3 of the cases there was no response to any form of medical treatment.

Hyperthyroidism as illustrated by these cases is regarded as a disease of two phases: In the first, the diencephalo–hypophysial centres are overactive and such conditions as goitre, exophthalmos, and vasomotor disturbances result. Such overactivity (which may be due to local lesions, nervous influences, or relapse from the inhibitory influence of thyroid and sex hormones), when prolonged, leads to the second phase, in which there is thyroid hypersecretion with consequent loss of weight, tachycardia, and rise in B.M.R. Patients are usually seen in the second phase, but the clinical picture varies according to whether central overactivity subsides or remains predominant. In the latter case antithyroid treatment alone may be unsuccessful, or even dangerous, and an attempt should be made to inhibit also hypophysial activity (for example, by administration of sex hormones, or of thyroid hormone itself).

[This is a stimulating, if somewhat speculative, paper, much of which, however, is too closely reasoned to abstract satisfactorily.] *H. McC. Giles*

2491. **Radioactive Iodine in the Treatment of Hyperthyroidism**

E. P. McCULLAGH and C. E. RICHARDS. *Archives of Internal Medicine* [*Arch. intern. Med.*] **87**, 4–16, Jan., 1951. 2 figs., 12 refs.

Radioactive iodine (^{131}I) was given to 203 patients with diffuse and 78 with nodular toxic goitres, the patients being observed for 2 or more months. The patients were selected because of old age, the presence of poor cardiovascular status, recurrence of symptoms after treatment with the thiouracil drugs or toxic reaction to these drugs, or refusal of surgical treatment. Difficulty was experienced in determining the correct dose of ^{131}I. An initial dose was given which was considered to be the smallest that might be expected to produce a satisfactory result, the total requirement being judged by the physiological response obtained. Patients with diffuse goitre whose thyroid was estimated to be of nearly normal size (that is, about 30 g.) were given 4 millicuries, and 1 additional millicurie was given for each additional 10 g. of gland. Thus a gland which was judged to be about twice normal size would be treated with 7 millicuries initially. The maximum initial dose given in this series was 17 millicuries. All patients were then seen at intervals of 2 months. Patients with severe hyperthyroidism who had not improved after 2 months were given the same dose again or an increased dose. Those whose basal metabolic rate (B.M.R.) remained still above +30% after 2 months were given half the original dose again. Those who had shown a relatively rapid response and whose B.M.R. was below +20% were kept under observation, but given no further treatment, for another 2 months. Only 4 of the patients with diffuse goitre had continuing hyperthyroidism 6 months after beginning treatment, and 7 others were believed to have had a recurrence of symptoms after a remission, giving a recurrence rate of about 3%; 19 patients developed mild hypothyroidism. An increase in the amount of exophthalmos was not prevented, but no severe exophthalmos developed in any patient. The goitre diminished greatly and generally disappeared after treatment.

Patients with nodular goitre generally required much larger doses than those with diffuse goitres. Thus only 23% of patients with diffuse goitre required more than 14 millicuries, but 69% of patients with nodular goitre required more than this dosage to control their hyperthyroidism. As a result of this, and also because it took longer to control them, the authors began giving doses of 20 millicuries or more to many patients with nodular goitre. One patient required a total dose of 104 millicuries and was still hyperthyroid after 9 months, but was normal after 15 months. In spite of the high doses given, 23% were still hyperthyroid at the time the report was made, but there was generally a surprising reduction in the size of the thyroid, which was reduced on the average to about half of its initial size. Four patients with toxic goitre died after treatment began, 2 from cerebral accidents, one from heart failure, and one from pulmonary embolus. *A. C. Crooke*

2492. **Diagnostic and Therapeutic Use of Radioactive Iodine**

D. E. CLARK, O. H. TRIPPEL, and G. E. SHELINE. *Archives of Internal Medicine* [*Arch. intern. Med.*] **87**, 17–24, Jan., 1951. 2 figs., 22 refs.

In this paper the authors discuss briefly the use of radioactive iodine (^{131}I) in the treatment of hyperthyroidism and carcinoma of the thyroid. Detailed analyses of the authors' results in the diagnosis and treatment of diffuse and nodular toxic goitres have been published elsewhere. In the treatment of carcinoma of the thyroid use is made of the observation that ablation of the remaining normal thyroid tissue by surgery or by irradiation may be followed by a significant increase in ^{131}I uptake by the malignant tissue. To achieve this, 35 millicuries was given every 2 weeks until no more localization of iodine could be recognized. Of 50 patients with thyroid carcinoma treated with ^{131}I, 31 were living at the time of the report. In only 15 did the tumour concentrate ^{131}I, and of these only 8 showed a good response to treatment. *A. C. Crooke*

2493. **Antithyroid Substances in the Treatment of Hyperthyroidism**

D. M. DUNLOP and C. F. ROLLAND. *Proceedings of the Royal Society of Medicine* [*Proc. roy. Soc. Med.*] **43**, 937–946, Dec., 1950. 4 figs., 1 ref.

Thiouracil or methyl thiouracil was given in 200 cases of thyrotoxicosis between 1944 and 1949. The dosage was usually 0·2 g. 3 times daily for the first 3 weeks, after which the dose was successively reduced to 0·2 g., 0·1 g., and 0·05 g. daily. In 128 cases treatment has been stopped for a sufficient length of time to permit judgment of results. Relapse occurred in 68 cases, the relapse

rate being high in patients treated for less than 6 months and much lower in those treated for more than 12 months. The majority of relapses occurred within 2 to 4 months of stopping thiouracil, and a second course of treatment induced further remissions. After stopping thiouracil, the thyroid usually became smaller than it was at the commencement of treatment. Toxic effects occurred in 22 cases and required cessation of treatment in 14 cases. No death occurred from toxic reactions or uncontrolled thyrotoxicosis: 10 patients had successful pregnancies under " cover " of thiouracil, none of the children being born with a goitre. Thyroidectomy was carried out for various reasons on 35 patients. The authors discuss the relative advantages of thyroidectomy and thiouracil and conclude that medical treatment is particularly indicated in the rare cases of thyrotoxicosis arising in children, in very old thyrotoxic patients, and in recurrent thyrotoxicosis following thyroidectomy. They consider that medical treatment is also preferable in young women with moderate thyrotoxicosis and unobtrusive goitres.

G. Ansell

2494. **1-Methyl-2-mercaptoimidazole and 1-Ethyl-2-mercaptoimidazole: a Clinical Evaluation of Two New Antithyroid Drugs**

W. H. BEIERWALTES. *Journal of Laboratory and Clinical Medicine* [*J. Lab. clin. Med.*] **36**, 861–865, Dec., 1950. 5 figs., 5 refs.

Following the report by Stanley and Astwood (*Endocrinology*, 1949, **44**, 588) that 1-methyl-2-mercaptoimidazole inhibits the rate of uptake of radioactive iodine by the human thyroid 100 times more effectively than thiouracil, and that clinical studies on 30 patients with hyperthyroidism indicated a high degree of effectiveness, the author has investigated the use of 1-methyl and 1-ethyl derivatives of mercaptoimidazole in the treatment of 20 patients with thyrotoxicosis: of these, 12 had exophthalmos, the remainder having nodular goitres. The optimum dosage was 40 mg. a day, given in four doses of 10 mg. every 4 hours during the day. No toxic effects were observed. The average rate of fall of the basal metabolic rate for the 20 patients was found to be roughly 1% a day, as compared with 1% in 2·5 days for thiouracil and propylthiouracil. There was a similar rise in plasma cholesterol level and body weight. Progressive exophthalmos was observed in 3 of 4 patients in whom measurements were made.

There were wide variations in response, although the total number of patients treated was small and the duration of treatment (2 weeks to 6 months) was short; the conclusion reached is that the two drugs are about equal in effectiveness and more than seven times as effective, weight for weight, as propylthiouracil.

G. I. M. Swyer

2495. **Treatment of Thyrotoxicosis with 2-Mercaptoimidazole. Clinical Impressions**

G. L. FOSS. *British Medical Journal* [*Brit. med. J.*] **2**, 1252–1257, Dec. 2, 1950. 7 refs.

The relative toxicity of 2-mercaptoimidazole in rats is one-tenth of that of thiouracil. The author found that the synthesis of thyroxine, measured by the uptake of ^{131}I by the thyroid, was inhibited by 100 mg. of 2-mercaptoimidazole, compared with 500 mg. of methyl thiouracil.

A series of 18 thyrotoxic patients were treated over a period of 18 months with 2-mercaptoimidazole. Later, 3 of these patients were excluded from the series because of failure to take their tablets or discontinuing attendance. They had all had previous medical treatment and had relapsed: 14 of the remaining 15 had not had previous treatment. An initial dose of 20 mg. of 2-mercaptoimidazole 3 times a day controlled the condition in 10 cases, but 4 required a total dose of between 80 and 100 mg. daily. One patient developed a toxic febrile illness, subsequently diagnosed as periarteritis nodosa, and treatment was stopped before the thyrotoxicosis was controlled. Of the 14 patients whose thyrotoxicosis was adequately controlled 13 were ultimately found to require a maintenance dose which varied between 5 and 60 mg. daily. Treatment was stopped in the fourteenth patient because of auricular flutter in a previously fibrillating heart; her goitre was removed surgically.

It is considered unlikely that the periarteritis nodosa or the auricular flutter which developed during treatment in these cases was due to intoxication, but 2 other patients developed symptoms which might have been caused by the drug. In one case a punctate irritating erythematous rash appeared on the forearms after 2 days' treatment but disappeared in spite of continued treatment. The other had several " blackouts " and brief spells of amnesia, but ultimately the condition was well controlled and symptoms were absent on a maintenance dose of 60 mg. daily

A. C. Crooke

2496. **The Parathyroid Glands and Phosphorus Homeostasis**

J. D. CRAWFORD, M. M. OSBORNE, N. B. TALBOT, M. L. TERRY, and M. F. MORRILL. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1448–1461, Nov., 1950. 5 figs., 43 refs.

In order to study the relation between phosphorus metabolism and parathyroid activity the authors performed experiments on young male rats of the Wistar strain (one group intact and one group parathyroidectomized) and on healthy adult human males. All diets were of known phosphorus content. The inorganic phosphorus content of urine and serum was estimated by the method of Fiske and Subbarow.

In intact rats a constant level of phosphorus in the serum was maintained on diets of greatly varying phosphorus content, whereas parathyroidectomized animals could tolerate only diets low in phosphorus, developing hyperphosphataemia when the intake was greater than 0·8 g. per sq. m. per day. Glomerular filtrate phosphorus (G.F.P.) increased with intake in both groups of animals; tubular resorption of phosphorus (T.R.P.), as calculated from the difference between G.F.P. and total urinary phosphorus, was, however, distinctly higher in parathyroidectomized than in normal animals. In fact, the intact animal can maintain a constant serum phosphorus level by means of adjustments in renal clearance, whereas the parathyroid-

ectomized animal cannot alter the ratio of T.R.P. to G.F.P.

In human subjects to whom parathyroid extract was administered the ratio of T.R.P. to G.F.P. fell markedly. A sudden increase in phosphorus intake resulted in a rapid decline in the ratio, whereas restriction in phosphorus intake was followed by a rise. These findings, in conjunction with the observations on rats, suggest that the relative constancy of serum phosphorus concentration in normal individuals is achieved by adjustments of parathyroid activity. *Nancy Gough*

ADRENAL GLAND

2497. **Hypercoagulability of the Blood associated with ACTH and Cortisone Therapy**
S. W. COSGRIFF, A. F. DIEFENBACH, and W. VOGT. *American Journal of Medicine* [*Amer. J. Med.*] **9**, 752–756, Dec., 1950. 2 figs., 6 refs.

This study was prompted by the observation of several thrombo-embolic complications, including 2 fatal cases of pulmonary embolism, in patients receiving cortisone or adrenocorticotrophin (ACTH). In 8 out of 10 patients the venous clotting time was considerably shortened during the administration of cortisone or ACTH, and in 4 out of 6 cases the " heparin retarded " venous clotting time was similarly reduced. No consistently significant changes were found in the prothrombin time, blood content of fibrinogen B, or protamine titration. It is concluded that both ACTH and cortisone frequently produce a hypercoagulable state of the blood, the mechanism of which is unexplained. *C. Bruce Perry*

2498. **Physiological Effects of Cortisone and Pituitary Adrenocorticotropic Hormone (ACTH) in Man**
R. G. SPRAGUE, M. H. POWER, and H. L. MASON. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1341–1347, Dec. 16, 1950. 16 figs., 28 refs.

2499. **Simulated Adreno-cortical Activity during Pregnancy in an Addisonian Patient**
J. W. JAILER and A. I. KNOWLTON. *Journal of Clinical Investigation* [*J. clin. Invest.*] **29**, 1430–1436, Nov., 1950. 3 figs., 15 refs.

It has been shown that normal pregnancy is associated with a rise in the excretion of glucocorticoids and 17-ketosteroids, an indication of increased maternal adrenal cortical activity. In this paper the authors describe the case of a woman with adrenal insufficiency who was under frequent observation at the Presbyterian Hospital, New York, during pregnancy. The course of an earlier successful pregnancy in the same patient has been reported previously (Knowlton *et al.*, *J. clin. Endocrinol.*, 1949, **9**, 514). Satisfactory control of the adrenal disease during the earlier part of pregnancy was achieved by the implantation of deoxycortone acetate (DCA) pellets, together with administration of sodium chloride by mouth, and from the seventh month onwards 2 mg. of DCA was injected daily. The patient was delivered 19 days prematurely of a healthy infant, and during the 4 months following remained in satisfactory health. The output of gonadotrophin, oestrogen, and pregnanediol was normal throughout this pregnancy. From the sixth week onwards the 17-ketosteroid excretion was markedly increased (from 4·5 to 9·9 mg. a day compared to 1 mg. a day one year before the onset of pregnancy). During the week following delivery steroid excretion fell gradually, and thereafter it was characteristic of Addison's disease. The output of neutral reducing lipids was within the range found in normal pregnancy, an unexpected finding in a patient with adrenal insufficiency.

A marked fall in eosinophil count occurred in the pregnant patient on administration of adrenocorticotrophin (ACTH); 10 days post partum this test was completely negative, even with large doses of ACTH given on 5 successive days. This finding does not support the possibility of the presence of residual adrenal tissue capable of responding to the stimulus of pregnancy. The output of 17-ketosteroids of the newborn infant was too small to account for the increased maternal excretion. Preliminary tests revealed ACTH-like activity in acetone-dried placental tissue from this case, suggesting that the placenta was the source of adrenal cortical hormones, or close analogues, during pregnancy. *Nancy Gough*

2500. **Addison's Disease occurring in Two Brothers**
J. N. BRIGGS, J. F. GOODWIN, and A. WILSON. *British Medical Journal* [*Brit. med. J.*] **1**, 115–117, Jan. 20, 1951. 3 figs., 7 refs.

Addison's disease occurring during adolescence in 2 brothers, and the necropsy findings in one of them, are reported.

The first patient, a boy of 12, had typical clinical and biochemical signs which became normal on treatment with adrenal cortical extract, deoxycortone acetate, and salt. Associated endocrine changes—bilateral undescended testicles and an underdeveloped penis—were rectified following the administration of chorionic gonadotrophin. His brother, aged 17, was admitted within a year; although the only abnormality was buccal and generalized pigmentation, he suddenly deteriorated after the administration of intravenous saline and died in 3 days. At necropsy both suprarenal cortices showed simple atrophy; the thymus was grossly enlarged, and both lungs had supernumerary lobes.

There was no family history of Addison's disease. The authors consider that simple atrophy of the suprarenals was the cause of the disease in both brothers, although the younger one had lived on unboiled, unpasteurized farm milk all his life and had calcified abdominal lymph nodes; they point out that the occurrence of Addison's disease at so early an age and in siblings suggests a genetic basis.

The literature on the genetic factor in Addison's disease is briefly reviewed, but it is emphasized that most of the cases were inadequately documented. The present authors conclude that the evidence in favour of a genetic factor in Addison's disease is suggestive.

Helen Grant

Dermatology

2501. **The Use of Testosterone in Elderly Women. A Preliminary Report**
B. B. WELLS, R. D. LOWREY, and E. P. COPE. *Journal of Investigative Dermatology* [*J. invest. Derm.*] **15**, 381–384, Nov., 1950. 2 figs., 11 refs.

Good results are reported from the use of testosterone propionate (25 mg. daily, or every other day, by injection) in a few elderly women with eczema of senile skin.
James Marshall

2502. **Percutaneous Absorption of Sodium in Cases of Exfoliative Dermatitis**
J. A. ELLIOTT and H. M. ODEL. *Journal of Investigative Dermatology* [*J. invest. Derm.*] **15**, 389–395, Nov., 1950. 4 figs., 7 refs.

Experiments were carried out which showed that in cases of exfoliative dermatitis a significant amount of sodium is not absorbed from baths of corn starch in a 0·0275 molar solution of sodium bicarbonate, but a significant amount of sodium is absorbed from baths of corn starch in a 0·275 molar solution of sodium bicarbonate. It would seem to be advisable to use only colloidal baths in cases where the skin barrier is disrupted and the patient has oedema due to nephrosis or congestive heart failure.
James Marshall

2503. **The Relation of Biotin to the Appearance of Certain Dermatoses in Early Childhood.** (Vztah biotinu ke vzniku některých dermatos prvého dětství)
J. ŠVEJCAR. *Časopis Lékařů Českých* [*Čas. Lék. čes.*] **89**, 1348–1353, Dec., 1950. 13 refs.

During the war years 1940 to 1945, when the nutrition of the Czech population was poor, a steep rise was noted in the incidence of erythroderma desquamativa (Leiner–Mousson syndrome) in infants. As soon as conditions improved, the disease became less common. A similar increase was observed during the war years 1914 to 1918. The satisfactory response of affected children to fresh liver, with its high biotin content, and recently to biotin injections (0·1 to 0·5 mg. per day) points to a relation between biotin deficiency and Leiner's disease and possibly also other seborrhoeic skin conditions in early infancy. In order to establish the pathogenesis, the biotin level was determined in cow's milk, " eledon ", and reconstituted dried milk, in breast milk, and in the blood and urine of healthy babies and of those suffering from Leiner's disease. The level in the artificial feeds was high (3 μg. per 100 ml. of cow's milk, 5 μg. in 100 ml. of eledon, and 5·6 μg. in 100 ml. of reconstituted dried milk). The level in the breast milk of mothers with healthy children (136 samples) was lower (0·4 to 3·9 μg. per 100 ml., mean value 1·6 μg. per 100 ml.), but was still above that in the milk of mothers of diseased babies (10 cases); here the values ranged from 0·7 to 1·3 μg. per 100 ml. (mean value 0·87 μg. per 100 ml.). The biotin content of the blood and urine of 7 healthy babies was 0·04 to 0·07 μg. per 100 ml. and 0·3 to 3·0 μg. per 100 ml. respectively. In breast-fed babies with Leiner's disease (9 cases) the biotin level was initially very low in the blood and urine (mean values 0·017 and 0·45 μg. per 100 ml. respectively), but increased rapidly after biotin treatment (mean values 0·27 and 26 μg. per 100 ml. respectively), while clinical manifestations disappeared. On the other hand, in affected babies on mixed feeds or completely artificially fed (8 cases) the biotin level was normal in the blood, but high in the urine (10·2 μg. per 100 ml.), probably indicating increased loss of biotin by excretion. On treatment there was an insignificant rise in the level in the blood and none in the urine, and the clinical syndrome remained unaffected except after administration of massive doses of biotin.

It is therefore assumed that the pathogenesis of Leiner's disease differs in artificially-fed babies from that in breast-fed ones. In the former some antibiotin factor may be present. It remains an open question whether seborrhoeic dermatitis is a mild variety of Leiner's disease. Only in 5 out of 20 cases of seborrhoeic dermatitis were low biotin values found in blood or urine, and only 3 responded satisfactorily to treatment. Two patients were cured by mixed feeding without biotin, and in the remaining patients with normal biotin values the condition remained unaffected.

The biotin values in children suffering from infantile eczema should be investigated as this disease occasionally develops after Leiner's disease and after seborrhoeic dermatitis.
M. Dynski-Klein

2504. **A Case of Generalized Norwegian Scabies.** (Un cas de gale norvégienne généralisée)
R. HISSARD, L. MONCOURIER, and J. JACQUET. *Annales de Dermatologie et de Syphiligraphie* [*Ann. Derm. Syph., Paris*] **10**, 657–667, Nov.–Dec., 1950. 6 figs., 28 refs.

Histopathological details are given of a case of scabies in a woman, aged 47, in which the condition suddenly changed from the ordinary form to a generalized crusted eruption. The patient died after 6 weeks from cachexia and anaemia. It is suggested that the enormous multiplication of the organisms in such cases is related to malnutrition or avitaminosis.
James Marshall

2505. **A Comparison of the Inhibitory Effect of Castellani's Paint and of Gentian Violet Solution on the *in vitro* Growth of *Candida albicans***
K. RILEY and A. H. FLOWER. *Journal of Investigative Dermatology* [*J. invest. Derm.*] **15**, 355–361, Nov., 1950. 2 figs., 8 refs.

This paper records a comparative study of the inhibitory activity of gentian violet solution, Castellani's compound solution of carbolfuchsin, and its individual components on a known virulent strain of *Candida albicans*. Gentian

violet inhibits growth in a dilution of 1 in 1,000,000, while inhibition with Castellani's paint begins at a dilution of 1 in 100. The alcoholic solution of basic fuchsin was the most active ingredient, showing inhibition in 1 in 100 dilution; 5% aqueous solution of phenol was next best at 1 in 50.

Other factors, such as drying and keratolytic effect, must play a large part in the action of Castellani's paint as a therapeutic agent in intertriginous moniliasis since it possesses such weak inhibitory activity.

James Marshall

2506. **The Treatment of Tinea Capitis without Fungicides**

R. W. CARSLAW. *British Journal of Dermatology* [*Brit. J. Derm.*] **63**, 16–20, Jan., 1951. 9 refs.

Culture showed that the majority of cases of small-spore ringworm of the scalp are due to *Microsporum audouini*. Of 208 patients treated by *x*-ray epilation, 207 were cured without the use of fungicidal applications. The average absence from school was 45 days. Of 17 patients with favus who were treated by *x*-ray epilation, 12 were cured. *John T. Ingram*

2507. **Experimental Herpes Simplex.** (Herpes experimental)

—. MAS Y MAGRO. *Actas Dermo-Sifiliográficas* [*Actas dermo-sifiliogr., Madr.*] **42**, 25–34, Oct., 1950. 5 figs., 23 refs.

Auto- and homo-inoculation of herpes simplex vesicle fluid in man led to vesiculation in about 50% of cases. The cytological picture in the fluid of such vesicles was the same as that in the natural disease, showing the special cells with "coronas" (seen in other vesicular virus diseases) and large multinucleated cells. Inoculation of guinea-pigs was always successful, the animals dying from one day to 2 weeks later. Vesicles were produced at the site of inoculation in about one-half of the cases. The vesicle fluid did not contain the special cells seen in man, but only polymorphonuclear leucocytes, polyblasts, and some lymphocytes, affected by a rapid process of lysis.

It is suggested that the large cells seen in man have special phagocytic powers, and that the "corona" consists of aggregations of elementary bodies.

James Marshall

2508. **Cheilitis Glandularis: a Manifestation of Emotional Disturbance**

A. R. WOODBURNE and O. S. PHILPOTT. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **62**, 820–828, Dec., 1950. 6 figs., 7 refs.

Cheilitis glandularis in 3 patients cleared up permanently on release of severe emotional tension by psychiatric treatment.

One patient had previously undergone plastic repair of the lip, with immediate recurrence of the condition, before psychiatric treatment was used, and study of the biopsy sections revealed no congenital abnormality or pronounced hyperplasia of the buccal mucous membrane or lip; the histopathological changes resembled those seen in eczema and neurodermatitis.

The authors conclude that there may be a group in which congenital abnormality is responsible for this condition, but having exhausted all organic approaches in these 3 cases, they are convinced that the condition was due to emotional disturbance. *G. A. Hodgson*

2509. **Personality Factors in Neurodermatitis. A Preliminary Study**

M. E. ALLERHAND, H. G. GOUGH, and M. L. GRAIS. *Psychosomatic Medicine* [*Psychosom. Med.*] **12**, 386–390, Nov.–Dec., 1950. 13 refs.

The authors of this paper claim that it is possible to separate a predominantly functional dermatitis, or neurodermatitis, from dermatitis of predominantly organic origin by the patient's responses to a questionary of 108 items. Three groups of 30 patients each were studied: a group with neurodermatitis, which included atopic and nummular eczema and lichen simplex chronicus; a group with skin disorders presumed to be non-psychogenic, such as plantar warts, leukaemia cutis, and morphoea; and a group of 30 medical patients with no skin disorder. The groups were comparable in respect of sex, marital status, occupation, number of previous admissions to hospital, and religion; the average age of the medical patients was greater than that of the two other groups.

It was found that a list of 26 items quite clearly separated the neurodermatitis group from both the others. The overlap was small—that is, few subjects from the two comparison groups had scores as high as the lowest in the neurodermatitis group. The picture of the patient with neurodermatitis emerging from the questionary is that of a person who is tense and restless and unable to relax easily, who has strong needs for recognition and success, who prides himself on his own strength and vitality, who tends to be impatient and irritable, and who sees the demands of others as impositions.

A study was made of the response in the three groups to the hypochondriasis scale of the Minnesota Multiphasic Personality Inventory. This scale did not separate the neurodermatitis group from the other two. It is not, therefore, hypochondriacal tendencies which characterize the patient with neurodermatitis, but a specific set of traits and attitudes which can be demonstrated by appropriate questions. For the list of 26 items the authors propose the name "neurodermatitis scale". *Desmond O'Neill*

2510. ***para*-Aminobenzoic Acid in Dermatitis Herpetiformis**

C. J. D. ZARAFONETIS, E. B. JOHNWICK, L. W. KIRKMAN, and A. C. CURTIS. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **63**, 115–132, Jan., 1951. 6 figs., 8 refs.

Potassium or sodium *para*-aminobenzoate, or a mixture of both, was taken by 16 patients with dermatitis herpetiformis. On a dose of 18 to 24 g. daily the pruritus ceased, the lesions disappeared, and no new lesions formed; this took 2 to 3 weeks. A maintenance dose of 12 to 15 g. daily kept all patients free, or almost free, from symptoms; one patient has been taking the

drug continuously for 30 months. Relapse began about 10 days after treatment was stopped. Renewal of treatment often caused an exacerbation for a few days and remission after 2 to 3 weeks. Intermittent treatment failed to control the disorder.

The only adverse side-effects in this series were nausea and, rarely, vomiting. These were relieved if the drug was stopped for 2 days; afterwards it could be resumed. Spontaneous hypoglycaemia has been reported to occur during treatment with *para*-aminobenzoic acid: this can be avoided if the patient eats well while taking the drug.

E. Lipman Cohen

2511. **Dermatitis Herpetiformis: a Follow-up and Survey of Treatment**

G. A. G. PETERKIN. *British Journal of Dermatology* [*Brit. J. Derm.*] **63**, 1–8, Jan., 1951. 1 fig., 16 refs.

In a series of 42 patients with dermatitis herpetiformis seen over a period of 25 years inquiry revealed that 16 were cured, in 7 the disease had improved to the extent that treatment was unnecessary, and in 19 it was still active. In 20% of a larger series of cases, dermatitis herpetiformis had started before the patient was 5 years of age. Of 18 patients who had suffered from pemphigus vulgaris 11 had died. *John T. Ingram*

2512. **Studies on the L.E. Phenomenon**

S. S. BARNES, T. W. MOFFAT, C. W. LANE, and R. S. WEISS. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **62**, 771–785, Dec., 1950. 4 figs., 9 refs.

The authors have confirmed the work of previous investigators on the lupus erythematosus (L.E.) phenomenon (presence of L.E. cells with the formation of clumps and rosettes in the blood). The phenomenon is not an artefact and is unrelated to the addition of anticoagulant.

Serum from patients with chronic discoid or disseminated discoid L.E. does not produce the phenomenon, nor does serum from other diseases in the so-called collagen group or from samples of blood with a high-titre syphilitic reaction. The L.E. phenomenon is a constant observation in acute lupus erythematosus in the active stage; it may be useful in diagnosis of fever of unknown origin. Previously unreported inclusion bodies of oval shape are described and are thought to be stages in the development of the L.E. body; two tests are described whereby L.E. cells can be induced to develop in normal leucocytes.

Sternal marrow in cases of subacute lupus erythematosus disseminatus usually gives negative results, but in some cases the blood serum may give definite positive results. *G. A. Hodgson*

2513. **The Heparin Tolerance Test in Lupus Erythematosus**

P. BORRIE. *British Journal of Dermatology* [*Brit. J. Derm.*] **63**, 21–27, Jan., 1951. 33 refs.

The ground substance of collagen is closely related to heparin. In collagenous diseases it is presumed that there is circulating in the blood a substance antagonistic to this ground substance and therefore to heparin. Investigation of 10 patients with acute lupus erythematosus showed that the blood contained a factor which inhibited the action of heparin to the same degree as that found in rheumatic fever. The bearing of this upon cortisone therapy is discussed. *John T. Ingram*

2514. **Effects of Cortisone on Acute Disseminated Lupus Erythematosus**

L. A. BRUNSTING, C. H. SLOCUMB, and J. W. DIDCOCT. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **63**, 29–52, Jan., 1951. 4 figs., 21 refs.

Thorough studies were made of 7 cases, in women, of acute disseminated lupus erythematosus treated with cortisone and adrenocorticotrophin (ACTH). The symptoms improved strikingly and rapidly, though high doses of cortisone (200 mg. daily) had sometimes to be used. The usual dose was 100 mg. daily. Relapse occurred at varying intervals after stopping treatment. Laboratory findings were either only slightly improved or were unchanged by the treatment. Wound healing was unaffected. The patients were euphoric during treatment and sometimes became temporarily unbalanced emotionally. Cessation of treatment was sometimes followed by feelings of depression and weakness. Rounding of the face, acne, and hirsuties disappeared after cessation of treatment; striae persisted. Salt and water retention was marked and, in one case, led to fatal oedema. Signs of a supervening acute infection could be dangerously masked. Cortisone and ACTH are dangerous substances which should be used only in the presence of facilities for full laboratory control.

E. Lipman Cohen

2515. **Some Observations on Treatment of Lupus Erythematosus Disseminatus and Spondylarthritis Ankylopoietica with ACTH and Cortisone.** [In English]

C. HOLTEN. *Scandinavian Journal of Clinical and Laboratory Investigation* [*Scand. J. clin. Lab. Invest.*] **2**, 300–316, 1950. 3 figs., 5 refs.

2516. **Disseminated Lupus Erythematosus in the Male. Report of Five Cases**

B. H. PASTOR, N. G. SLOANE, and H. L. GOLDBURGH. *New England Journal of Medicine* [*New Engl. J. Med.*] **244**, 81–84, Jan. 18, 1951. 10 refs.

2517. **Lichen Striatus**

H. LEE. *Lancet* [*Lancet*] **1**, 615–617, March 17, 1951. 3 figs., 8 refs.

A typical case of lichen striatus is reported. The onset followed rubella. A summary of the clinical and histological findings is given. It is important to remember this condition in the differential diagnosis of linear dermatosis, because an excellent prognosis can be given.—[Author's summary.]

2518. **Abnormalities in the Chemical Composition of the Skin Surface Film in Psoriasis**

S. ROTHMAN. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **62**, 814–819, Dec., 1950. 20 refs.

2519. **Lentigo Senilis**
E. P. CAWLEY and A. C. CURTIS. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **62**, 635–641, Nov., 1950. 6 figs., 6 refs.

The authors summarize current knowledge of the usual type of lentigo. The clinical aspects, histopathology, differential diagnosis, and treatment are discussed.
G. B. Mitchell-Heggs

2520. **Keratoderma Palmaris et Plantaris Congenitalis**
D. MACAULAY. *British Medical Journal* [*Brit. med. J.*] **1**, 334–336, Feb. 17, 1951. 3 figs., 6 refs.

A case of the diffuse form of keratoderma palmaris et plantaris congenitalis in an infant is reported. The family tree is given, showing direct transmission through seven generations. The mode of inheritance and the numerical incidence strongly suggest a simple Mendelian dominant. The condition is world-wide in incidence, and is probably commoner than reports would suggest.—[Author's summary.]

2521. **Morphea-like Epithelioma**
M. R. CARO and J. B. HOWELL. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **63**, 53–69, Jan., 1951. 9 figs., 31 refs.

This is a well-illustrated description of 33 cases of epidermal tumours, nearly all of basal-cell type, which clinically resembled the lesions of morphea (localized scleroderma).
R. A. Willis

2522. **Epithelioma Adenoides Cysticum: Basal Cell Nevi, Agenesis of the Corpus Callosum and Dental Cysts. A Clinical and Autopsy Study**
G. W. BINKLEY and H. H. JOHNSON. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **63**, 73–84, Jan., 1951. 8 figs., 19 refs.

The authors describe the case of a woman dying at the age of 30, in whom clinical and necropsy examinations revealed the following combination of lesions: many small lesions of epithelioma adenoides cysticum of the head, neck, and trunk; multiple dental follicular cysts; supervening fibrosarcoma of the mandible with metastases in skull, ribs, vertebrae, and many viscera (the cause of death); partial agenesis of the corpus callosum; a bifid 6th rib. A fatty tumour of the foot had been removed when the patient was 14 and a fibroma of the ovary when she was 18.

[Good illustrations accompany this very interesting report.]
R. A. Willis

2523. **White Atrophy and Leg Ulcer with Intolerable Pain.** (Atrophie blanche et ulcère de jambe à douleurs intolérables)
R. GONIN. *Annales de Dermatologie et de Syphiligraphie* [*Ann. Derm. Syph., Paris*] **10**, 633–650, Nov.–Dec., 1950. 11 figs., 30 refs.

The aetiology of leg ulcers is discussed, with descriptions, clinical and histological, of some cases of white atrophy (first identified by Milian) associated with painful ulceration. Under the atrophic plaque there is a well-marked diminution in the number of capillaries. Around the lesion develop clusters of subepidermal vessels with hypertrophied walls and dilated lumina; there is no cellular reaction around these vessels. Deep in the dermis the vessels show endarteritis, often with fragmentation of the inner layer of the intima and always with proliferation of the elastic and connective tissues. The lumina of the vessels are often much diminished. Arterial lesions are the more important, but hypertrophy of the walls of the veins is sometimes seen. Milian regarded syphilis as the cause of white atrophy, but the author can find no support for this theory; antisyphilitic remedies are ineffective. Treatment of the ulcers by the electric cautery is the most effective method of allaying the pain, but sometimes surgical measures are necessary to secure vasodilatation.
James Marshall

2524. **Porokeratosis (Mibelli)**
H. HABER and A. PORTER. *British Journal of Dermatology* [*Brit. J. Derm.*] **63**, 28–32, Jan., 1951. 3 figs., 14 refs.

A girl aged 10 years showed porokeratosis, affecting the skin of the right arm and leg, of 7 years' duration. Painting with thorium X caused marked improvement. Vitamin-A therapy was of no benefit in spite of a low vitamin-A level in the plasma.
John T. Ingram

2525. **Treatment of Haemangiomatous Naevi with Thorium X**
R. E. BOWERS. *British Medical Journal* [*Brit. med. J.*] **1**, 121–124, Jan. 20, 1951. 18 refs.

This study of 44 patients with haemangiomata treated with thorium X revealed no evidence of serious damage to the skin as a consequence of the treatment given.

Many raised cavernous angiomata are flat in their early stages, and spontaneous resolution may incorrectly be attributed to thorium-X treatment. There is definite evidence that a proportion of patients respond to some extent to this treatment, but the age at which treatment is started does not seem to influence the result. If good response is likely, there will be evidence of improvement after 12 applications and there is rarely any further response after 35 applications. The value of cosmetic applications is stressed.
John T. Ingram

2526. **Basal-cell Carcinomas of the Skin Treated by Local Podophyllin Applications. A Preliminary Report.** [In English]
L. G. LARSSON. *Acta Radiologica* [*Acta radiol., Stockh.*] **34**, 449–452, Dec., 1950. 5 figs., 8 refs.

2527. **Formaldehyde in the Treatment of Warts**
F. W. LYNCH and I. M. KARON. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **62**, 803–813, Dec., 1950. 1 fig., 8 refs.

2528. **Multiple Glomus Tumors**
W. H. EYSTER and H. MONTGOMERY. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **62**, 893–906, Dec., 1950. 5 figs., 17 refs.

See also Section Disorders of the Blood, Abstract 2459.

Venereal Diseases

2529. **The Danger of Penicillin Therapy in Gonorrhoea**
A. A. M. Reekie. *Lancet* [*Lancet*] **1**, 327–328, Feb. 10, 1951. 13 refs.

Though the possibility that a concomitant syphilitic infection may be masked or modified by penicillin therapy of gonorrhoea has been appreciated since 1944, it is generally held that when such is the case, clinical or serological evidence of syphilis is usually forthcoming within 3 months of infection. In this article the author describes 3 cases of gonorrhoea treated with 150,000 units of procaine penicillin, in which 2 of the patients were found to have serum-negative primary syphilis 10 to 11 weeks after treatment, and the third secondary syphilis 19 weeks after treatment. All 3 patients denied exposure to risk of reinfection, and it is of particular interest that each one of them had complained of shivering and headache a few hours after penicillin therapy.

The author concludes that unexplained fever and malaise occurring shortly after penicillin treatment of gonorrhoea strongly suggests a Herxheimer reaction in a still incubating syphilitic infection, and he [rightly] stresses that all patients should be questioned after treatment and that those complaining of such side-effects should be carefully observed, both clinically and serologically, for 6 months. *G. L. M. McElligott*

2530. **Treatment of Early Syphilis with Four Weekly Injections of Procaine Penicillin and Aluminum Monostearate. Preliminary Report**
W. C. Buschemeyer, A. B. Loveman, and F. B. Zaugg. *American Journal of Syphilis, Gonorrhea and Venereal Diseases* [*Amer. J. Syph.*] **35**, 67–71, Jan., 1951. 6 refs.

In 44 out of 53 cases of early syphilis treated with 300,000 units of procaine penicillin in aluminium monostearate there was a good response at the end of 6 months. Of these 44 patients, 38 had become, and remained, negative to serological tests. Of the remaining 9, 1 was reinfected, 3 relapsed serologically, 4 had muco-cutaneous relapses, and 1 had involvement of the central nervous system. *G. M. Findlay*

2531. **Treatment of Early Syphilis with Penicillin, Mapharsen, and Bismuth (Combined Therapy)**
L. Chargin, N. Sobel, and T. Rosenthal. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] **63**, 104–114, Jan., 1951. 17 refs.

Numerous investigators have reported that combined treatment with penicillin, arsenic, and bismuth gives better results than penicillin alone in both human and experimental syphilis. In order to test this, 470 patients suffering from early syphilis were treated with 6 million units of penicillin (either in oil–wax or as procaine penicillin with aluminium monostearate) given daily for 10 consecutive days, followed by 20 injections of oxophenarsine (0·045 to 0·06 g. twice weekly for 10 weeks) and a weekly injection of bismuth for 10 weeks, concurrent with or following the arsenic; the total period of treatment was 10 to 16 weeks.

Of 72 patients (15·4%) with seronegative primary syphilis, 70 remained seronegative and 2 relapsed or were reinfected; of 67 with seropositive primary syphilis, 62 became seronegative, 4 remained seropositive, and 1 was a failure; of 170 with secondary syphilis, 132 became seronegative, 37 remained seropositive, and 1 failed; of 161 with early latent syphilis, 88 became seronegative and 73 remained seropositive. The observation period was 8 to 21 months and the success rates in the four groups were 97·1, 92·5, 77·6, and 54·6% respectively; when these figures were compared with those obtained when penicillin only, in total dosage of 4·8 million units over 16 days, was employed, little difference was noted; a similar percentage of patients remained seropositive with the two types of treatment. It was in the relapse or reinfection rates that a big difference was noted; 3·9% with penicillin alone and 0·85% with combined therapy. Arsenical toxic dermatitis was relatively rare, though in some cases severe; there were no fatalities. It is concluded that in seronegative primary syphilis penicillin alone is adequate, but that in seropositive early syphilis there is a case for employing combined treatment.

[Most syphilologists in Great Britain use bismuth as well as penicillin, and some employ arsenic as well; the objection to arsenic is the risk of toxic reactions, but this to some extent is offset by the effectiveness of BAL. It is obvious that early reinfection is much less likely after combined treatment than after penicillin alone, and in some degree this would apply to early relapse, since bismuth remains in the tissues for a comparatively long period.] *T. E. Osmond*

2532. **Effectiveness of Penicillin in the Prevention of Congenital Syphilis**
L. W. Shaffer and C. J. Courville. *Archives of Dermatology and Syphilology* [*Arch. Derm. Syph., Chicago*] 63, 91–103, Jan., 1951. 7 refs.

A series of 631 women who had been treated for syphilis with penicillin in amounts varying from 2,400,000 to 9,600,000 units gave birth to a total of 636 infants, including five sets of twins; 225 were treated before, and the remainder during, pregnancy.

There were 58 " disastrous " results (16 abortions and miscarriages, 21 stillbirths, 16 neonatal deaths, and 5 living syphilitic children); 3 infants were lost to observation; and 575 (90·41%) were normal; this last figure compares favourably with that of 87·6% for 4,902 normal pregnancies. Of the 58 disastrous results, 7 were regarded as due to syphilis (one stillbirth, one neonatal death, and 5 infected children), 14 as possibly due to syphilis, and 37 as not due to the disease.

Of the 631 women, 225 had been treated with penicillin alone or in combination with oxophenarsine hydrochloride and bismuth before, but not during, pregnancy;

of these 225, 167 were seronegative or did not have serum tests, and 58 were seropositive at the time of delivery. There were 10 disasters, none due to syphilis, among the former, and 14 among the latter (3 due to relapse late in pregnancy, 3 to lack of treatment, one to lack of co-operation by the patient, and 4 possibly to syphilis; 3 were probably not due to syphilis). From these figures it is concluded that pregnant women who have been treated previously need not be retreated during pregnancy if they have become, and remained, seronegative, nor need those who are seropositive if the titre is low [and there are no clinical signs of syphilis].

In 27 women who were treated for early infectious syphilis during pregnancy with 3 to 9·6 million units of penicillin (13 received arsenic and bismuth as well) there were 6 disastrous results, 2 of which were due to syphilis as a result of treatment failure or reinfection during the last month of pregnancy.

Radiographs were taken of long bones of most of the babies in whom the cord blood was positive; even when these showed syphilitic changes it was found that if the mother had had adequate treatment the baby was cured by this and did not itself require treatment.

Two types of antibody are produced in the Rh-sensitized mother; a univalent one, detected by complement-fixation tests, which can pass through the placenta; and a bivalent one, detected by flocculation tests, which cannot. In the case of the former the titres are the same in the mother and child; in the latter the level of reagin is lower in the child's than in the mother's blood.

Penicillin given at any time will either protect or cure the child in nearly 100% of cases. *T. E. Osmond*

2533. **The Serological Diagnosis of Congenital Syphilis in Infants and Young Children.** (Die Blutserumreaktion als Diagnostikum der Lues congenita beim Säugling und Kleinkind)

G. GUMPESBERGER. *Zeitschrift für Haut und Geschlechtskrankheiten* [*Z. Haut- u. GeschlKr.*] **9**, 505–516, Dec. 15, 1950. 38 refs.

The diagnosis of congenital syphilis is discussed. In the absence of clinical manifestations the Wassermann reaction remains the mainstay of diagnosis. Radiological study of the skeleton is at times of little help, as the changes may be simulated by non-specific conditions. The "luotest" reaction [an intradermal luetin test] becomes positive, only after the first year of life and therefore is of no use in early diagnosis. Similarly, the cerebrospinal fluid is often normal in these infants and its examination therefore unjustified because at this age it is not even of prognostic value.

The author found that passive transfer of reagin, as shown by the finding of positive reactions in cord blood with early decline to negative, was present in only 3·5% of infants born to syphilitic women. These children are perfectly healthy and need no treatment. Diagnosis and treatment should be delayed in an apparently healthy infant whose only abnormality is a positive reaction in the cord blood until further tests can be taken 2 to 3 weeks later; if the Wassermann reaction is still positive, treatment is instituted. If the reaction in cord blood is positive but that in the mother's blood negative, the child is treated as a congenital syphilitic, for it is thought that the reagin must have been produced in the child. If the apparently healthy infant has a negative Wassermann reaction but that of the mother is positive, regular blood tests and radiographs should be taken during the first year of life and possibly longer. Prophylactic treatment of the infant is advised if the mother was untreated. In the majority of affected infants the serum reaction will become positive within 3 months if it was not so at birth. In one case it became positive at 9 months. If it is negative in mother and child at the time of birth, the chance that congenital syphilis is present is minimal.

[Radiological examination of long bones, particularly in early congenital syphilis, can be of real diagnostic value. To treat an apparently healthy infant for syphilis because its Wassermann reaction is still positive at 2 to 3 weeks might be deemed hasty by some, because in a great number of cases it is known to have reverted permanently without treatment to negative after 3 to 4 months; it should therefore be permissible to wait that long, unless the titre of the reaction is rising.] *G. W. Csonka*

2534. **Treatment of Experimental Syphilis with a Combination of Penicillin and Bismuth.** (Traitement de la syphilis expérimentale par l'association pénicilline-bismuth)

C. LEVADITI and A. VAISMAN. *Presse Médicale* [*Pr. méd.*] **58**, 1397–1399, Dec. 16, 1950. 10 refs.

Experimental treatment of syphilis in rabbits demonstrated that the best results are obtained with a combination of depot-penicillin and bismuth. With this combination disappearance of spirochaetes and healing of lesions is more rapid, and sterilization of the lymphatic system, blood, spleen, and bone marrow is obtained with smaller doses of the medicaments than when either drug is used alone. *James Marshall*

2535. **Role of the Portal of Entry in Transmission of Syphilis to Mice.** (Rôle de la porte d'entrée dans la transmission de la syphilis à la souris)

A. VAISMAN. *Annales de Dermatologie et de Syphiligraphie* [*Ann. Derm. Syph., Paris*] **10**, 651–656, Nov.–Dec., 1950. 3 figs., 9 refs.

The author has found that whereas to infect mice with syphilis by the subcutaneous route (the most commonly used) it is necessary to use a large number of organisms, a much smaller dose is effective by cutaneous application (on a manually epilated area or lightly rubbed tail) or intravaginal inoculation. This difference is probably due to local destruction of the organisms in the subcutaneous tissues before they can reach their zones of election, the same protective response not being elicited in the superficial layers of the skin and certain mucous membranes. *James Marshall*

2536. **A Study of the Filter Paper Microscopic (FPM) Test for Syphilis. Preliminary Report**

A. HARRIS and S. OLANSKY. *Journal of Venereal Disease Information* [*J. vener. Dis. Inform.*] **32**, 1–4, Jan., 1951. 1 ref.

Genito-urinary Disorders

2537. **The Clinical Use of NU-445 (Gantrisin) in the Treatment of Urinary Tract Infections. A Report of 100 Cases**
B. L. STEWART and J. J. LASH. *Journal of Urology* [*J. Urol.*] **64**, 801–810, Dec., 1950. 5 refs.

"Gantrisin" is a sulphonamide (3 : 4-dimethyl-5-sulphanilamido-*iso*xazole) which is extremely soluble within the *p*H range of 6·0 to 7·5; hence the chance of crystallization in the kidney is greatly reduced. *In vitro* and in animals it has proved therapeutically promising so that it was decided to try it in human cases of urinary infection; 100 cases were studied which were broadly divisible into 53 cases of cystitis and 47 of pyelonephritis. The former included 11 cases of acute and 42 of chronic infection; of the cases of pyelonephritis 12 were acute, 21 chronic, and 14 were of infected hydronephrosis. The micro-organisms isolated from the specimens varied greatly but, as expected, the majority were *Bacterium coli*; others included staphylococci and streptococci, *Pseudomonas*, *Proteus vulgaris*, and the *Alkaligenes* group. The dose of the drug was 4 g. daily for adults, divided into 4 doses, until a total of 25 g. had been given; for children the daily dose was 2·5 g., in five doses, until 20 to 25 g. was reached. No alkalis were given but the fluid intake in adults was maintained at 2 litres daily.

Growth of approximately 43% of the infecting organisms was controlled within 24 hours, but *Alkaligenes* and *Proteus* were more resistant, while the most resistant was *Aerobacter aerogenes*. Of the 100 patients treated, 67 were actually cured, and for some at least of the failures physical factors may have been to blame, such as recurrent papillomata, hydronephrosis with only partial success of pyloroplasty, presence of residual urine, infected diverticula, and recurrent renal calculi. No side-effects were serious, the most marked being severe urticaria in one case. *S. M. Vassallo*

2538. **Renal Blood Flow and Glomerular Filtration Rate in Patients with Valvular Heart Lesions.** [In English]
E. BLEGEN and K. AAS. *Acta Medica Scandinavica* [*Acta med. scand.*] **138**, 391–412, Nov. 10, 1950. 23 refs.

The renal plasma flow and glomerular filtration rate were estimated by the *p*-aminohippurate, inulin, and sodium thiosulphate methods. Occasionally creatinine clearance was also measured. In all, 8 normal subjects and 37 patients with heart disease were examined before and after exercise, in hypoxaemia (inhalation of 9·5% oxygen in nitrogen), and after inhaling 100% oxygen. The cases were divided functionally into those with slight failure (dyspnoea on exertion) and those with evidence of circulatory impairment at rest, and pathologically into cases of left-sided failure only (from valvular lesions, including coarctation of the aorta) and those with left- and right-sided failure.

In all cases of impaired cardiac function, no matter how slight, decrease in renal plasma flow and in glomerular filtration rate were noted, even if there was no evidence of congestion or of hypoxaemia. That this in itself does not cause decreased renal function was shown by the marked increase in renal plasma flow without change in filtration rate which followed upon inhalation of reduced concentrations of oxygen. An exception to this rule was found in patients with aortic stenosis, in whom renal blood flow was decreased by hypoxaemia. Inhalation of pure oxygen caused variable and paradoxical effects. The conclusion reached is that decreased renal function is not of major importance in the pathogenesis of cardiac oedema.
James D. P. Graham

2539. **The Effects of Cortisone on the Course of Acute Glomerulonephritis. Report of a Case**
C. H. BURNETT, M. A. GREER, B. A. BURROWS, J. H. SISSON, A. S. RELMAN, L. A. WEINSTEIN, and C. G. COLBURN. *New England Journal of Medicine* [*New Engl. J. Med.*] **243**, 1028–1032, Dec. 28, 1950. 1 fig., 10 refs.

A case of acute glomerulonephritis was studied for 43 days. During this period, 200 mg. cortisone was administered daily for 12 days. The signs of nephritis at that time were haematuria, albuminuria, and the presence of urinary casts. While the patient was on cortisone there was a rise in temperature and increase in protein and erythrocytes in the urine, probably a non-specific effect. It was considered doubtful whether cortisone had been of benefit. *G. Loewi*

2540. **Male Sterility, Spermatogenesis, and Spermatophagia.** (Stérilité masculine, spermatogénèse et spermatophagie)
H. BAYLE and C. GOUYGOU. *Presse Médicale* [*Pr. méd.*] **59**, 87–90, Jan. 24, 1951. 8 figs.

The authors describe in detail the factors that influence spermatogenesis, and from their experience in 126 cases of azoospermia and 207 epididymal biopsies they discuss the value of anastomosis of the epididymis to the vas deferens. In all these cases there was a mechanical block to the outflow of spermatozoa, and it was possible to demonstrate that spermatogenesis was still taking place and that the spermatozoa were eventually taken up by giant cells, which the authors call "spermatophages". In some cases the spermatozoa escaped from the tubules into the interstitial tissue, where they set up a foreign-body reaction; this spermatorrhagia probably results from rupture of distended tubules. The authors believe that anastomosis of the vas and epididymis is an extremely worth-while operation.
G. S. Crockett

See also Section Pathology, Abstract 2321.

Disorders of the Locomotor and Osseous Systems

2541. **General Symptoms in Scapulo-humeral Periarthritis.** (Almensymptomer ved periarthrosis humeroscapularis)
E. MEULENGRACHT. *Ugeskrift for Læger* [*Ugeskr. Læg.*] **112**, 1711–1717, Dec. 14, 1950. 6 figs., 12 refs.

In 1945 the author described several cases of scapulohumeral periarthritis, the condition being associated with prolonged fever, loss of weight, and a high erythrocyte sedimentation rate. He has now analysed all cases of this condition admitted to one of the medical units of the Bispebjerg Hospital, Copenhagen, between 1945 and 1950 (a total of 82 cases) in order to establish the incidence of generalized symptoms and signs.

In 16 cases there was low fever, a temperature of about 38° C. (100·4° F.) lasting for at least several weeks and in some cases for 6 months and even longer. The erythrocyte sedimentation rate was raised in 53 cases, in 24 of them above 50 mm. in one hour. In no less than 16 cases the condition complicated thyrotoxicosis. Fleeting pains in various parts of the body often preceded the local condition, and soft-tissue involvement in the hands, including contractures, is also described.

W. G. Harding

2542. **Senile Ankylosing Hyperostosis of the Spine**
J. FORESTIER and J. ROTES-QUEROL. *Annals of the Rheumatic Diseases* [*Ann. rheum. Dis.*] **9**, 321–330, Dec., 1950. 6 figs., 10 refs.

From pathological and radiological examination of 9 patients and 2 necropsy specimens the authors describe a condition of hyperostosis of the spine which can be distinguished from ankylosing spondylitis and osteoarthritis.

The condition occurs in old men and always affects the dorsal, frequently also the lumbar, and sometimes the sacral and cervical spine. Other joints, including the sacro-iliac, are unaffected, and the erythrocyte sedimentation rate is normal. Stiffness is the main symptom, pain being generally absent.

Radiological examination reveals bony outgrowths arising from the antero-lateral aspect of the vertebral bodies and growing upwards, showing in lateral views as "candle-flame formations" in the lumbar region and "continuous but irregular flowing outgrowths" in the dorsal region. In an antero-posterior view there is often a dense and woolly appearance of the vertebral bodies. These hyperostoses consist of a dense cortex, like that of the femoral head, covering cancellous bone which is continouus with that of the vertebral body.

Treatment is seldom indicated and the condition is often an incidental discovery. It is suggested that the hyperostoses probably arise in the continuous perivertebral sheath, and that the possibility of a prostatic disorder stimulating bone formation might be investigated.

Kathleen M. Lawther

2543. **Renal Rickets and Osteitis Fibrosa in Children and Adolescents**
R. H. FOLLIS. *Bulletin of the Johns Hopkins Hospital* [*Bull. Johns Hopk. Hosp.*] **87**, 593–615, Dec., 1950. 16 figs., 12 refs.

The author records 16 cases of renal insufficiency, due to various lesions, in which skeletal changes were discovered. Two main osseous lesions were seen: (1) bony trabeculae coated with osteoid and showing a resemblance to rickets, and (2) bony destruction with fibrous-tissue replacement suggestive of osteitis fibrosa. Whereas the youngest children showed changes of rickets only, older cases presented a mixed picture or one of osteitis fibrosa only. Stress is [rightly] laid on the fact that the bony lesions which may complicate renal disease are exceedingly complex, and that while excess parathormone may or may not play a part, it is quite erroneous to regard these lesions as purely secondary to hyperparathyroidism and therefore unrelated to true rickets.

G. J. Cunningham

RHEUMATOID ARTHRITIS

2544. **A Theory of the Pathogenesis of Rheumatoid Arthritis**
A. D. WALLIS. *Annals of the Rheumatic Diseases* [*Ann. rheum. Dis.*] **9**, 331–340, Dec., 1950. 1 fig., 40 refs.

The author points out that there is general agreement that circulating antibodies are capable of becoming fixed in tissue cells, especially at such sites as the walls of arterioles. If circulating antigen unites with cell-fixed antibody, sensitivity reactions take place. There is some support for the suggestion that tissue-fixed antibodies diminish vasoconstriction and that this factor may play a part in the aetiology of rheumatoid arthritis. Many varied factors such as changes of climate, emotional conflicts, and infections have been blamed for setting off the rheumatoid process; these may act through the peripheral arterioles.

There is evidence that women have a higher potential peripheral vascular tone than men, and women are more prone to develop rheumatoid arthritis. Except for infection, the factors causing superficial peripheral vasoconstriction may also cause rheumatoid arthritis. It may be, however, that infection, through the production of antibodies, upsets peripheral vascular tone and acts remotely through this mechanism. Diminished response in peripheral vessels may be the key to the development of rheumatoid arthritis; but the response of smooth muscle to prolonged stimulation is not as yet fully understood and the word fatigue can be used only in a qualified sense, for fatigue in smooth muscle may be merely a diminished response to stimulation.

The author attempts to correlate vasoconstrictor fatigue with metabolic derangement of the cells of the synovial membrane. It may be that an enzyme is produced as a result of vasoconstrictor fatigue which perverts the synthesis of hyaluronic acid and produces an antigen and an irritant; the antigen then produces tissue-fixed antibody which will cause vasoconstrictor fatigue, and the vicious circle of rheumatoid arthritis will be established. A possible explanation of the effect of jaundice on rheumatoid arthritis is that bile salts denature the irritant products of vasoconstrictor fatigue. Cortisone may act similarly but in a more transient fashion. The author supports the concept of rheumatoid arthritis arising as a result of a particular emotional diathesis which leads to vasoconstrictor fatigue.

W. Tegner

2545. **Oral and Intravenous Iron Therapy in the Anaemia of Rheumatoid Arthritis**
D. N. Ross. *Annals of the Rheumatic Diseases* [*Ann. rheum. Dis.*] **9**, 358–362, Dec., 1950. 8 refs.

The response of 200 patients suffering from rheumatoid arthritis and anaemia to iron therapy was studied. With ferrous sulphate, or ferrous sulphate with folic acid, by mouth and intravenous iron over a period of 25 days no statistically significant differences in the response of three groups thus treated were noted. This was attributed to a refractory period in the response to iron, so the experiment was repeated over a 3-month test period. In this case a statistically significant increase was obtained in the response to intravenous iron over that to oral iron, the figures for the rise in percentage of haemoglobin being 15 and 8 respectively.

These results tended to support findings of other workers that the response to intravenous iron is better in patients with a low erythrocyte sedimentation rate (E.S.R.) than in those with active disease and a high E.S.R., but in contrast to the series reported by Sinclair and Duthie a good response was obtained in 31 patients in whom the E.S.R. was high. This is attributed to the fact that intravenous iron was given twice weekly for a month instead of daily for 6 days. It is suggested that the anaemia of rheumatoid arthritis is due to deficient iron absorption from the gut and that intravenous iron overcomes this satisfactorily, although it first has to make up depleted iron in the " basic stores of the body ".

W. Tegner

2546. **The Effect of Some Steroids (Testosterone Propionate, Desoxycorticosterone Acetate and Ascorbic Acid, and 21-Acetoxy-△-5-pregnenolone, (" Artisone Acetate ")) in Rheumatoid Arthritis**
H. M. Margolis and P. S. Caplan. *Annals of Internal Medicine* [*Ann. intern. Med.*] **34**, 61–71, Jan., 1951. 6 refs.

This report summarizes in general terms the experience of the authors in the treatment of 64 cases of the " typical clinical picture of generalized rheumatoid arthritis "; 31 patients were treated with large doses of testosterone propionate, 28 patients with deoxycortone (desoxycorticosterone) acetate and ascorbic acid by the technique of Lewin and Wassén, and 5 patients with " artisone " (21-acetoxy-△-5-pregnenolone). Tables of results are given. The authors conclude that none of these three individual methods produced any specific beneficial effect. Assessment was based in general terms on subjective changes, and objectively on measurement of erythrocyte sedimentation rate and studies of blood. Controls were included. Subjective systemic improvement as a result of testosterone therapy was the only benefit noted in 61% of this group. Three patients given artisone were subsequently treated with adrenocorticotrophin (ACTH) with the usual beneficial results.

Harry Coke

2547. **The Treatment of Diseases of Dysreaction (Rheumatoid Arthritis, Asthma) with Nitrogen Mustards.** (Le traitement des maladies de dysréaction (arthrite rhumatoïde, asthme) par les moutardes azotées)
C. Jiménez-Diaz, A. Merchante, J. Perianes, E. Lopez, and J. Puig. *Helvetica Medica Acta* [*Helv. med. Acta*] **17**, 583–592, Dec., 1950. 2 figs., 44 refs.

It is fortunate, in the opinion of the authors, that many disease processes can be favourably influenced without much knowledge of their aetiology. In this connexion they make a brief reference to the dramatic effects of cortisone and adrenocorticotrophin (ACTH) in rheumatoid arthritis, as demonstrated by Hench and his collaborators; they also refer to the work of Klemperer and others on the " collagen diseases " and to Selye's theory of " diseases of adaptation ". Antigen–antibody reaction in the tissues is discussed, as well as the possible precipitation in the ground substance of " mucopolysaccharide acid ". Some workers have claimed that cortisone and ACTH increase the amount of circulating γ-globulin and of antibodies, while others have been unable to confirm these results; there is general agreement, however, that these hormones decrease the number of circulating eosinophils.

Cortisone and ACTH are difficult to produce and their prolonged use may result in unpleasant side-effects. The authors were encouraged in their decision to use a nitrogen mustard (HN3) by the fact that these drugs produce an eosinopenia comparable to that caused by the above hormones; their over-all effect was to produce all the phenomena of the " alarm reaction ". Although extirpation of the adrenals does not abolish this reaction, hypertrophy of these glands (stimulation by nitrogen mustard) can be demonstrated at necropsy. The excretion of 17-ketosteroids in the urine is increased. Brief histories are given of 14 cases of rheumatoid arthritis treated with HN3 intravenously (0·1 mg. per kg. body weight, on alternate days, to a total of 4 or 5 injections). Although these cases were of long standing, with severe manifestations, the beneficial effects were not in doubt; in 9 of them they were remarkable. Swellings and effusions largely disappeared and the power of locomotion was restored to bedridden patients. One month later, all cases were reassessed. In only 3 of them was there partial relapse; in the rest improvement was maintained. Blood counts showed a constant fall in circulating leucocytes, mainly in lymphocytes and eosinophils; leucopenia tended to increase a fortnight after

cessation of treatment and reached its peak in those cases given more than 15 mg., thrombocytopenia frequently appearing in these cases. Although, in general, side-effects were not alarming, the authors consider it wiser to limit the number of injections to 3 (4 to 5 mg. each); with this dosage no complications need be feared. The erythrocyte sedimentation rate was unaffected; excretion of uric acid in the urine fell at first but subsequently rose, and that of 17-ketosteroids was initially increased and later returned to its original level.

Six cases of bronchial asthma have been treated so far (5 of them in status asthmaticus). The effects were comparable to those reported from the use of ACTH, and clinical improvement appeared to keep step with the reduction in circulating eosinophils. The authors have begun to treat other cases of " dysreaction " (dermato-myositis, sclerodermia, psoriasis), but results are not yet available. Though the mode of action of HN3 is still obscure they think that it is similar to that of ACTH and cortisone; they draw attention to the anti-mitotic effect of ACTH and HN3. *D. Preiskel*

2548. **Methods of Treatment of Rheumatoid Arthritis and Ankylosing Spondylitis Depending on Stimulation of Pituitary–Adrenal Function (other than Treatment with Cortisone and ACTH).** (Traitements hypophysosurrénaux des polyarthrites chroniques évolutives et de la spondylarthrite ankylosante. (En dehors de la cortisone et de l'ACTH))

F. Coste and F. Lacronique. *Annals of the Rheumatic Diseases* [*Ann. rheum. Dis.*] **9**, 305–316, Dec., 1950. 24 refs.

The authors report the results of using various procedures for stimulating pituitary–adrenal activity in the treatment of rheumatic diseases.

Methods used included adrenaline or histamine administration, induction of general anaesthesia, analgesia of the carotid sinus or of the superior cervical ganglion, denervation of the carotid sinus, application of short-wave diathermy to the adrenals, irradiation of the pituitary, shock therapy, sex-hormone administration (testosterone with or without ascorbic acid, and progesterone), administration of whole adrenal cortical extracts, and other hormone therapy. The cases were mostly of rheumatoid arthritis or polyarthritis, but some cases of ankylosing spondylitis were included.

These procedures all failed to produce any significant beneficial results, but the authors consider that the negative evidence may be of value in the search for substitutes for ACTH and cortisone.

Kathleen M. Lawther

2549. **The Synergistic Action of *para*Aminobenzoic Acid and Cortisone in the Treatment of Rheumatoid Arthritis**

L. L. Wiesel, A. D. Barritt, and W. M. Stumpe. *Brooklyn Hospital Journal* [*Brooklyn Hosp. J.*] **8**, 148–152, 1950. 11 refs.

The authors treated 3 cases of severe or moderately severe rheumatoid arthritis with cortisone, the efficacy of the treatment being judged by assessment of joint pain and swelling. Cortisone was given in dosage sufficient to reduce these to a minimum. Reduction of the dose of cortisone to 25 mg. a day then produced a relapse in all 3 cases. When, however, a daily dose of 12 g. of sodium *p*-aminobenzoate was added to this small dose of cortisone, joint pain and swelling abated once more. Control treatment with *p*-aminobenzoic acid alone had no effect on the arthritis. *G. Loewi*

2550. **Oral Use of Cortisone Acetate**

E. W. Boland and N. E. Headley. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 8–11, Jan. 6, 1951. 10 refs.

It has been reported in several recent papers that cortisone can be given by mouth and will, in most cases, produce results in rheumatoid arthritis as striking as those obtained by intramuscular injection. It is also generally agreed that the dosage needed by the former route approximates to that usually given by the latter.

A report is given of the treatment of 23 patients with chronic rheumatoid arthritis by oral administration of cortisone, the study being designed to compare its effectiveness with that of intramuscular administration.

In all but one of these cases the oral route was found to be highly effective in suppressing the activity of the disease and controlling the rheumatic manifestations. It seemed in general that the therapeutic effects produced by oral administration occurred more rapidly and disappeared more rapidly than was the case when injections were used. In about half of the series larger amounts were needed to produce equal maintenance effects, the oral dose ranging from one-fifth to one-third more than the injected dose. No gastro-intestinal symptoms occurred as a result of oral administration, but the period of observation in this series was too short for any conclusions to be drawn as regards the safety of prolonged administration.

W. S. C. Copeman

2551. **Oral Steroid Medication in Rheumatoid Arthritis**

H. Freeman, G. Pincus, S. Bachrach, C. W. Johnson, G. E. McCabe, and H. H. MacGilpin. *Journal of Clinical Endocrinology* [*J. clin. Endocrinol.*] **10**, 1523–1532, Dec., 1950. 4 figs., 7 refs.

An analysis is presented of the results of treating 17 men and 47 women suffering from rheumatoid arthritis with large doses (500 mg. daily) of pregnenolone by mouth. Placebo treatment was first given for 2 weeks, and 3 patients who improved during this period were excluded from the series. Of the remainder, 24 (38%) showed major improvement as evidenced by diminution of pain, increase in joint mobility, decrease in swelling, and increase in strength. Duration of treatment was from 3 to 30 weeks, with a mean of 12·3 weeks. In half the cases the erythrocyte sedimentation rate (E.S.R.) fell to normal, the mean figure after treatment being 64% of the original value. The average fall in eosinophil count in this group was 28%. In 26 cases (42%) there was mild and less striking improvement. Fall in E.S.R. was less, the mean value after treatment being 74% of

the pre-treatment level. Eosinophil count did not fall in this group. No improvement as regards either symptoms or E.S.R. occurred in 14 cases. Relapse was usual after cessation of treatment. The authors believe that maximal improvement was obtained with 500 mg. a day; larger doses brought no further improvement. No constant untoward effects were noted. Oral medication is considered preferable to injection. Injected crystals may remain for weeks undissolved in the muscles.

C. L. Cope

2552. **The Influence of Artificial Pyrexia and of Progesterone on the Adrenal Cortex in Chronic Rheumatism.** (Influenza della piressia artificiale e del progesterone sul corticosurrene nel reumatismo cronico)
T. Lucherini, E. Cecchi, and M. Volpicelli. *Minerva Medica* [*Minerva med., Torino*] **2**, 483–490, Sept. 22, 1950. 3 figs., bibliography.

A survey of the literature on adrenocorticotrophin stimulated the authors to give to 27 patients with rheumatoid arthritis or with osteo-arthritis one of 3 kinds of treatment: production of artificial pyrexia by stock vaccine, or administration of deoxycortone or progesterone, the last two being combined with ascorbic acid administration. Pyrexia produced a fall of eosinophil count and a corresponding increase in the ratio of uric acid to creatinine in the urine of 3 patients out of a group of 10. The second form of treatment, given in 12 cases, produced a fall in eosinophil count in 2 and a rise in the ratio of uric acid to creatinine in 8. Progesterone (one dose of 100 mg.) was given to only 4 patients, but clinical changes were not significant. Perhaps the changes observed were due to stimulation of both the pituitary and the adrenal glands. *E. Neumark*

2553. **Salicylazosulfapyridine (Salazopyrin or Azopyrin) in Rheumatoid Arthritis and Experimental Polyarthritis**
W. C. Kuzell and G. M. Gardner. *California Medicine* [*Calif. Med.*] **73**, 476–480, Dec., 1950. 14 refs.

Of 30 patients with rheumatoid arthritis treated with "salazopyrin" (salicylazosulphapyridine), one had to stop treatment because of the sudden onset of anaemia and another refused to continue after 2 days because of "nervousness"; 14 gained no benefit, but in 14 there was marked improvement. The ages of the last group (in 5 of whom the presence of ankylosing spondylitis was recorded) varied from 24 to 64 years, and the duration of illness from 1 to 15 years; daily doses of 1·5 to 4 g. of salazopyrin were given for periods of 2 months to 1 year, all but one of the group being still in receipt of a daily maintenance dose. Improvement, shown by diminution in joint swelling, stiffness, and pain, always began during the first 7 to 14 days of treatment. All these patients became worse when treatment had twice to be interrupted because of a shortage of salazopyrin. Toxic effects included restlessness and sleeplessness, mild nausea, and, in one case, a skin rash; the authors state that in only one case (that referred to above) was there a toxic effect on haematopoiesis [although in one of the group improved by treatment a reduction in erythrocyte count and haemoglobin concentration is shown]. No significant effect was observed upon the erythrocyte sedimentation rate.

When salazopyrin was added in a concentration of 0·5% to the food of rats injected with the L-4 strain of pleuropneumonia-like organism (which produces a polyarticular arthritis) the incidence of arthritis was very slightly lower, and the survival rate higher, than in the control animals; when the concentration was raised to 1% and 3%, the incidence of arthritis was higher than in the controls. Other rats and mice given 1% salazopyrin for periods up to 121 days showed no consistent variation in body weight or leucocyte count compared with untreated controls.

[The discrepancy between these results and those of Sinclair and Duthie (*Ann. rheum. Dis.*, 1949, **8**, 226) is attributed to the smaller and more prolonged dosage used in the present study; since improvement was always apparent within 2 weeks this explanation seems inadequate. In the absence of controls or of any quantitative measure of improvement the significance of these clinical results is debatable.] *H. McC. Giles*

2554. **Tonsillectomy in Chronic and Postacute Rheumatoid Arthritis.** [In English]
N. G. Richtnér. *Acta Oto-laryngologica* [*Acta oto-laryng., Stockh.*] **38**, 419–438, Oct., 1950.

The author has studied the effect of tonsillectomy in cases of polyarthritis. Of 860 patients (283 males and 577 females), 432 underwent tonsillectomy (149 males and 283 females). A careful history was taken of ear and throat conditions, especially of throat infections; a positive history and, in some cases, a raised erythrocyte sedimentation rate influenced the decision to operate. In 164 cases the tonsils were examined histologically and on the basis of the pathological findings the cases were divided into two groups: (1) (110 cases) with definite signs of inflammation of the tonsils; (2) (54 cases) with signs of hyperplasia only, and little or no inflammatory change. On studying the incidence of these findings as regards positive and negative pharyngeal histories the authors concluded that even with a positive tonsillar history it was not possible to form any definite opinion what the pathological findings would be. No statistically significant difference in the mean erythrocyte sedimentation rate was found between the tonsillectomy group and the control series, even when the cases were classified as regards positive and negative pharyngeal history and positive and negative tonsillar findings.

The author points out that American investigators have recently advanced the view that chronic polyarthritis is probably associated more with metabolic disturbances rather than with infectious conditions. No significant difference was noted in the tonsillectomy series as regards the joints involved at the time of the patient's admission to and discharge from hospital.

E. D. Dalziel Dickson

See also Section Pharmacology and Therapeutics, Abstract 2273; and Section Disorders of the Blood, Abstract 2453.

Neurology

2555. **Radioactive Diiodofluorescein in Diagnosis and Localization of Central Nervous System Tumours**
L. DAVIS, J. MARTIN, M. ASHKENAZY, G. V. LEROY, and T. FIELDS. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1424–1432, Dec. 23, 1950. 14 figs., 27 refs.

This is an account of a technique which has been used in 200 cases of suspected central nervous system tumours. An accuracy of 95·5% in localization is claimed in lesions verified by surgical intervention, pneumography, or angiography. The histological nature of the lesion was indicated in 86 out of 95 histologically verified cases. In all the 200 cases there were only 9 proved cases of inaccuracy in diagnosis by the radioactive-diiodofluorescein test. Pneumography was only 63% " focally accurate " and electroencephalography only 45% " focally accurate ".

The technique is based on the assumption that dyes of the fluorescein group have a selective affinity for tumour cells; production of a stable radioactive diiodofluorescein labelled with ^{131}I and containing no free radioactive iodine enabled these studies on cerebral tumours to be carried out. It is used in a sterile 8 to 10% solution and approximately 1·1 millicuries of the radioactive dye is injected intravenously, precautions being taken to prevent contamination of the skin of the patient and operator. The uptake in the brain is then determined by a radiation detector consisting of four major components: a Geiger–Müller tube with an aluminium cap which effectively eliminates most of the ^{131}I beta-radiations; a lead shield with a thickness of 1·2 cm., the tube being mounted in this shield, which extends 1·5 cm. beyond the end of the Geiger tube, and tube and shield mounted on a 360-degree yoke and swivel attached to a wall-mounted dental *x*-ray-tube arm; a modified counting-rate meter, with a 1,000 count per minute full-scale range, connected to the tube through a pre-amplifier; and a mechanical graphic recorder with recording speed of 6 minutes per inch (2·5 cm.).

The survey of the skull with the Gieger tube involves at least 32 different positions, including 13 areas symmetrically placed on each side, alternating from left to right, and 6 midline positions. It is essential to count at all of the 32 sites, but since there is only a limited significant time interval of about 2 hours, the order of counting should vary so that the clinically suspected areas are measured at least two or three times for greater accuracy. By the end of 3 to 4 hours the readings are only confirmatory, for the differential concentrations of the dye between the normal and tumour areas are no longer striking.

The range of normal concentrations is given for each position. If the observed concentration at all sites is greater than the upper range of normal by 100 to 600 counts per minute, the presence of a tumour should be suspected. For localization of this tumour comparisons are then made with the opposite side and also with the areas adjacent to the one under suspicion. The over-all increase in radioactivity in patients with verified brain tumours may be such that the count over the tumour itself may be 50 to 100% greater than the count over the same site in a normal brain at a comparable time interval. It is considered that there is no radiological hazard to the patient from the use of diiodofluorescein in doses of 1·0 to 2·0 millicuries.

[This paper should be read by all who are interested in the clinical application of radioisotopes. If the authors' results can be universally repeated, we shall have a technique of intracranial localization of great value to the neurosurgeon. It is described as " simple, safe, painless and reliable ", but it is obvious from the text of the article that long and painstaking practice with the method would be necessary before an accuracy of 95·5% could be expected. The difficulties would lie in the interpretation of results, however, and not in the technique.] *J. MacD. Holmes*

2556. **The Physiological Teaching of Pavlov and Neurological Diagnosis.** (Физиологическое учение И. П. Павлова и неврологическая диагностика)
S. N. DAVIDENKOV. Невропатология и Психиатрия (*Nevropat. Psikhiat.*] **19**, No. 6, 13–18, 1950. 3 refs.

Many clinical neurological phenomena can be understood correctly only in the light of Pavlovian physiology. The laws of positive induction explain why thalamic hemialgia is sometimes increased at the moment of falling asleep, when the inhibition has spread over the cortex but has not yet descended to the thalamus. Conversely, when such a patient wakes and the cortex resumes its activity, the irritability of the thalamus is reduced in accordance with the principles of negative induction. These states of positive and negative induction may be initiated not only by sleep, but also by the absence of motor activity. This is often seen in vestibular crises, the onset of which some patients learn to avoid by continued movement.

The past experience of each patient, the sum of temporary connexions which are specific for him, may result in individual variations of organic illness. The appreciation of this fact is particularly useful in the differential diagnosis of epilepsy and hysteria. True epilepsy may, contrary to common belief, be associated with a complex psychogenesis, and the contents of epileptic hallucinations are at times coloured by the past personal experience of the patient.

Pavlov's concepts of the phasing of cortical activity are helpful in the understanding of facts relating to aphasia and apraxia. Thus the diseased cortical cells may be in an equalizing phase, when strong and weak stimuli each produce the same effect, or in a paradoxical

phase, when strong stimuli cause supraliminal inhibition, while weak stimuli remain effective. This is so in cases where the patient is unable to repeat a word when ordered to do so (a stronger stimulus), but has no difficulty in doing so in the course of spontaneous speech. One of the author's patients, for example, was unable to perform, when ordered to do so, a simple and well understood movement of the hand, but had no difficulty in doing it when gesticulating. The use of these principles makes it unnecessary to resort to such psychological interpretations as loss of movement image or memory.

Narcolepsy and catalepsy are syndromes which are best understood as restriction of the spread of inhibition in the cortex. In narcolepsy most of the cortex is inhibited while the motor analysers remain active. The reverse is the case in catalepsy, where partial sleep extends only to the motor analyser.

Thanks to Pavlov it is also possible to understand the physiological mechanism of hysterical disorders; he believed that this mechanism is specific for hysteria and that the leading element in it is suggestion operating in a patient with a persistently raised emotional tone.

L. Crome

2557. **Observations on Diaphragmatic Movement in Some Neurological Disorders**

P. K. ROBINSON, W. H. MOSBERG, and R. C. W. LOWE. *Journal of Neurology, Neurosurgery and Psychiatry* [*J. Neurol. Neurosurg. Psychiat.*] **13**, 296–306, Nov., 1950. 4 figs., 22 refs.

A method of continuous recording is described by means of which a permanent graph may be obtained, representing the simultaneous movement of both leaves of the diaphragm. Groups of patients with different neurological disorders were examined and the findings presented.

A control group of 14 normal males between 25 and 35 years was also investigated. The excursion of the right dome of the diaphragm was found to be constantly less than the left during quiet breathing. This difference was reduced during forced breathing.

Fourteen cases of chronic hemiplegia (8 right-sided and 6 left-sided) were examined. There was no significant difference between the records of patients with right hemiplegia and those of normal subjects in quiet breathing. In left hemiplegia during quiet respiration the left diaphragm appeared to move less, compared with the right, than in normal subjects. During forced breathing, however, there was a clear tendency towards diminished movement on the paralysed side.

Six cases of myasthenia gravis were examined. The vital capacity may be a useful guide to the severity of the condition [neostigmine] and the response to " prostigmine " of value in prognosis. It is suggested that thymectomy has a beneficial effect on the diaphragm as part of a generalized muscle improvement.

The findings in cases of palatal myoclonus, lesions of the cervical spinal cord and phrenic nerve, Huntington's chorea, myopathy, and certain other neurological disorders are briefly described.—[Authors' summary.]

2558. **Synchronous Activity in Normal and Atrophic Muscle**

F. BUCHTHAL and A. MADSEN. *Electroencephalography and Clinical Neurophysiology* [*Electroenceph. and clin. Neurophysiol.*] **2**, 425–444, Nov., 1950. 8 figs., 23 refs.

While synchronization of the action potentials from two motor units in a normal, weakly contracting muscle is uncommon, its occurrence in neuromuscular disease has been stated by Buchthal and others to have diagnostic value. It is said to be no more common with lesions of peripheral nerve or muscle than in the normal, but to be considerably more frequent with lesions of the spinal cord involving the anterior horn cells. Other workers, however, have denied this relationship and also consider that the apparent synchronization is due to pick-up from a single large motor unit, the number of smaller, low-threshold units having been greatly reduced by the disease.

The authors applied an electronic method of assessing the coincidence of action potentials picked up from two separate sites in the same muscle. The probable chance coincidence was calculated and subtracted from the observed coincidence; the resultant figures showed a marked tendency to fall around 100%, or zero. From observations on 20 normal subjects arbitrary criteria were adopted, over 70% coincidence being regarded as synchronization.

On this basis less than 20% of the points examined in normal muscle showed synchronization, though figures were higher for the small muscles of the hand and for fatigued muscle. A similar percentage was found in atrophic muscles, with the exception of those in which atrophy was due to anterior horn cell involvement, in which the proportion was 60%.

The possibility of pick-up occurring from two points in single large units is discussed and rejected; from previously published figures on the size and numbers of muscle fibres, it is concluded that the motor unit would have to be of quite extraordinary size for this to occur.

W. A. Cobb

2559. **Effects of Cortisone in Certain Neuromuscular Disorders**

G. M. SHY, S. BRENDLER, R. RABINOVITCH, and D. MCEACHERN. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1353–1358, Dec. 16, 1950. 5 figs., 9 refs.

Cortisone was used in the treatment of 12 patients with muscular or neuromuscular disorders, thorough clinical, biochemical, and electromyographic investigation being carried out before, during, and after treatment. In all cases muscle biopsy was performed before cortisone was administered. Two typical cases of dystrophia myotonica were completely free of myotonia while they were having cortisone, this abnormality returning when cortisone therapy was stopped; there was also some increase of muscle power during treatment. Two patients with motor neurone disease showed no improvement with cortisone, while one patient with myasthenia gravis (apparently associated with a tumour of the thymus) became very much more myasthenic

while he was having cortisone: when administration was stopped his condition gradually returned to its previous state. Of 2 patients with disseminated lupus erythematosis and marked muscle weakness, both constitutional symptoms and muscle power improved with cortisone in one case, while in the other there was no increase of muscle power in spite of relief of the constitutional symptoms. One patient had an unusual type of muscular dystrophy with flexion contractures of the elbows and knees and fixation of the spine in hyperextension: no improvement occurred in this man. The remaining 4 patients suffered from a condition which the authors call " menopausal myopathy " in which, during the 50–60 age period, weakness of the muscles of the shoulder and pelvic girdles develops, with comparatively little wasting but with histological changes typical of a myopathy. In 3 of these patients there was considerable increase of power during cortisone administration and relapse when it was withdrawn. The authors have previously noted improvement in this condition when wheat-germ oil is given, and relapse when it is discontinued, and they raise the question as to whether " wheat germ may not contain building blocks for steroid hormones ". *J. W. Aldren Turner*

2560. **Methoin in the Treatment of Epilepsy**
D. P. JONES. *British Medical Journal* [*Brit. med. J.*] **1** 64–67, Jan. 13, 1951. 20 refs.

The author reports the results of treatment of 24 cases of major and psychomotor epilepsy with methoin (3-methyl-5 : 5-phenylethylhydantoin), a preparation which is allied chemically to troxidone and phenytoin. The drug was administered by mouth in doses of 0·1 g. twice daily, increasing by 0·1 g. daily at either weekly or fortnightly intervals. The maximum maintenance dose was 2·1 g. daily. A reduction of at least 70% in the incidence of fits was secured in 40% of the cases of major epilepsy and in 31% of the cases of psychomotor epilepsy. Unfortunately the drug gave rise to toxic effects which included drowsiness, dizziness, headache, indigestion, constipation, and acute fever associated with a moribilliform rash. The drowsiness was controlled effectively with small doses of dexamphetamine. Neither hypertrophy of the gums nor ataxia was observed. Two women complained of a pronounced increase in weight. Electroencephalograms were taken in 18 cases and showed a variety of changes including the development of frequencies of uniform amplitude (8 cases), an increase in fast activity (15 cases), and a decrease in slow-wave activity (3 cases). Severe dermatitis developed in one instance. Although the rash resolved it was found necessary to abandon the treatment because blood examinations showed the presence of leucopenia. Relative lymphocytosis was detected in 8 cases. In a woman aged 40 years the treatment caused aplastic anaemia which proved fatal.

The author concludes that methoin is a potentially toxic drug and that it should be administered only when other methods have failed. Each course of treatment should be of short duration. It is advisable not to give the drug together with troxidone or other drugs which cause similar toxic reactions. The patient and his attendants must be warned to notify the occurrence of any adverse effects, and blood examinations must be made at regular intervals. *A. Garland*

2561. **Petit Mal Epilepsy Occurring in Status**
W. M. TUCKER and F. M. FORSTER. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 823 827, Dec., 1950. 2 refs.

A short note on the types of petit mal epilepsy is followed by accounts of 2 cases in which petit mal seizures occurred with such frequency as to constitute status epilepticus. The first case was that of a woman of 43 who had been subject to petit mal for 32 years and grand mal for 24. When seen in June, 1948, she was taking phenobarbitone 0·1 g. and " epanutin " (phenytoin) 0·1 g. per day. She had 18 months' freedom from petit mal, and since grand mal attacks were now the main problem the dose of phenytoin was increased to 0·3 g. a day. This resulted in an increase of the " short stares ", so troxidone (" tridione ") (0·3 g. daily) was added. In October of that year, 3 days after a radical mastectomy, she became confused and listless and remained in this state for 36 hours. An electroencephalogram showed that the patient was indeed in petit mal status. The dose of troxidone was increased to 0·6 g. daily. The attacks ceased and have not recurred.

The second case was that of a boy of 10, seen in 1945, who had grand mal and petit mal seizures. Phenytoin 0·3 g. was given. After one week he became confused, wandering, and could not answer questions satisfactorily. He had occasional bilateral involuntary movements; an electroencephalogram showed continuous runs of wave-and-spike formation. Inhalations of carbon dioxide stopped the status epilepticus in 12 minutes. In 1946 troxidone became available, and in dosage of up to 2·1 g. daily, with phenobarbitone 0·1 g. daily, has controlled the attacks.

The authors stress the difficulty of recognizing the condition and the importance of the electroencephalogram. The fact is re-emphasized that phenytoin increases petit mal and in these cases precipitated status epilepticus. *L. A. Liversedge*

CENTRAL NERVOUS SYSTEM

2562. **Life Expectancy and Probable Disability in Multiple Sclerosis**
J. IPSEN. *New England Journal of Medicine* [*New Engl. J. Med.*] **243**, 909–913, Dec. 7, 1950. 4 figs., 6 refs.

This is a review of the morbidity and mortality of disseminated sclerosis in the Boston–Brookline area of the United States in the years 1939 to 1948. The data consisted of cases recorded by hospitals and clinics, by practising physicians, and by official death registration. The average annual prevalence was estimated at 51 cases per 100,000 population with a marked sex difference, the rate in males being 37 per 100,000 and in females 64.

In assessing the degree of disability, three categories were used: working full-time; ambulatory, unable to

work but able to look after themselves; and bedridden. Only a small proportion of patients (4% males and 3% females) die each year, but the majority are unable to work. The average duration of the disease was estimated by comparing the average age at onset with the average age at death, and was found to be 17·5 years for males and 15·5 years for females. There are some differences according to the age of onset of the disease; thus males who develop the disease at 20 die at an earlier age than females, whereas there is no appreciable difference between the sexes when the onset is at 30 or over. Most (70%) will cease work within 5 years, but 23% will be working 10 years, and 3% 25 years, after the onset; after 11 to 14 years the average patient becomes bedridden and dies in 12 to 20 years. These periods are less when the disease is acquired after the age of 45.

[This is in keeping with other published work showing that disseminated sclerosis is a more chronic disease than is generally realized. No clinical details are given in this fairly short paper, so one cannot judge what criteria were used to determine the difficult question of when the disease starts in an individual case.]

N. S. Alcock

2563. **Encephalitis and Encephalomyelitis in England and Wales during the Last Decade**

J. G. GREENFIELD. *Brain* [*Brain*] **73**, 141–166, 1950. 5 figs., 33 refs.

In England and Wales encephalitis has recently been rare, about 100 cases a year being reported, with a mortality of 30 to 50%. Most of the fatal cases have been post-infective in origin; there has been no evidence of insect-borne encephalitis, but a few cases of two acute and two subacute types have been seen for the first time.

Acute polioclastic encephalitis was studied in 10 fatal cases. The illness lasted for from 2 to 3 days to 4 weeks, beginning with headache, malaise, and fever, followed in a few days by a coma from which the patient could be roused. Physical findings were few. The cerebrospinal fluid generally contained a few lymphocytes; the protein content was low at first; the pressure was at first high but fell later. There were varying degrees of perivascular infiltration in the brain stem, basal ganglia, and cortex. In some cases there was more widespread infiltration with microglial hyperplasia and glial stars. Nerve cells were little affected, but some showed eosinophilic degeneration. The lesions were confined to the grey matter, with some meningeal exudate around large veins.

Acute haemorrhagic leuco-encephalitis appeared as a rapid hemiplegia, often post-influenzal. The brain was swollen and oedematous, with multiple small haemorrhages in the central parts of the centrum ovale, spreading to the pons and cerebellar peduncles. There was intense polymorphonuclear exudation around the blood vessels, with some necrosis. The appearances resembled those in experimental allergic encephalitis.

Subacute inclusion-body encephalitis is a disease of children, slowly developing over weeks, with myoclonic jerks and spasms leading to dementia and rigidity, and death in 7 weeks to 8 months. The cerebrospinal fluid, otherwise normal, shows a paretic Lange curve. Histologically there is widespread perivascular infiltration, microglial hyperplasia, and astrocyte gliosis of the cortex, basal ganglia, and grey matter of the brain stem. Neurones may be degenerated; many contain acidophil inclusion bodies, starting as granules and cohering to form masses which may fill the nucleus.

Subacute sclerosing encephalitis occurs in children and is similarly characterized by myoclonic jerks and torsions; the findings in the cerebrospinal fluid are similar. In the brain there is widespread focal inflammation with partial demyelination in the centrum ovale and diffuse glial sclerosis. The lesions are, however, not confined to the white matter; they resemble those of the previous group, but there are no inclusion bodies. Detailed reports of 14 cases are given.

Gwenvron M. Griffiths

2564. **Cerebral Circulation in Postencephalic Paralysis Agitans**

H. A. SHENKIN and J. C. YASKIN. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **65**, 29–33, Jan., 1951. 5 refs.

Paralysis agitans may be of arteriosclerotic origin or post-encephalitic. In the latter type vascular changes have been described, but the lesions have been attributed to other causes. In a series of 8 cases with a positive history the cerebral circulation was studied by the nitrous oxide method. Of these, 6 showed rigidity and were progressive, the other 2 were hyperkinetic and stationary.

In 5 patients low values for the cerebral blood flow were found, in one it was normal, but the 2 hyperkinetic cases gave markedly high figures: 5 showed increased cerebrovascular resistance, and 4 a reduction in oxygen consumption. Bilateral resection of the stellate ganglion was performed in 4 patients and the observations were repeated: 3 showed increase in blood flow, the hyperkinetic case no change. No clinical improvement occurred from the operation, but the cases were of long standing, with probably irreversible changes.

Gwenvron M. Griffiths

2565. **Cerebral Rheography.** (Rheographische Untersuchungen am Schadel)

K. POLZER and F. SCHUHFRIED. *Wiener Zeitschrift für Nervenheilkunde* [*Wien. Z. Nervenheilk.*] **3**, 295–298, 1950. 3 figs., 4 refs.

" Rheography ", a new method of investigation of the hydrodynamic balance in a part of the body, is described. The method is based on changes in electrical conductivity, which can be graphically recorded, occurring in a limb or head during the hydrodynamic fluctuations of a circulatory cycle. An alternating current of medium frequency is used and the graph obtained is compared with that of a healthy individual. An electrocardiogram in the first lead is taken simultaneously for timing. Electrical conductivity being proportionate to the cross-section of the conductor, the rheogram will consequently indicate the variations in volume of the examined part. With fair elastic conditions of the large vessels the volume and blood pressure are largely proportionate to each other, and the curve

of the rheogram is therefore very similar to the pressure curve of the pulse. The practical value of such investigations is demonstrated by the account of a case of endarteritis obliterans of the brain vessels where the rheogram showed marked deviations from the normal curve and a difference between the right and left sides of the head in conformity with the clinical observations.

F. F. Kino

2566. **The Syndrome of Anosognosia**

E. A. WEINSTEIN and R. L. KAHN. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 772–791, Dec., 1950. 2 figs., 36 refs.

The term " anosognosia " was introduced by Babinski to describe a patient's denial that he was suffering from left hemiplegia. It is now used in a wider sense, and in this report covers the denial of a wide variety of defects caused by cerebral tumour. A report is given of 22 cases, with tumours situated in all parts of the brain. More than one defect was denied in all cases; these defects ranged from hemiplegia or blindness to sexual impotence or merely ill-health. Anosognosia was not specially associated with any particular lesion and never occurred as a single phenomenon. Every patient was disorientated in time, and 19 out of the 22 were disorientated for place. Nearly all had a paraphasic speech disturbance, all confabulated, and 10 had hallucinations. Changes in affect were striking, and 15 patients were markedly euphoric. In all cases there was some loss of memory and retention. Nevertheless the anosognosia could not be accounted for solely in terms of loss of memory, or as a disturbance of " body-scheme ", or, in the case of hemiplegia, as a result of sensory loss. Cases were seen in which the denial of a defect disappeared at a time when the severity of the defect remained unchanged. Administration of amylobarbitone then restored the anosognosia and, with it, disorientation and confabulation during the resulting mental confusion.

The authors conclude that anosognosia has no focal diagnostic value but is a " manifestation of the patient's drive to be well ".

Donald McDonald

2567. **Visual-spatial Agnosia associated with Lesions of the Right Cerebral Hemisphere**

J. MCFIE, M. F. PIERCY, and O. L. ZANGWILL. *Brain* [*Brain*] **73**, 167–190, 1950. 5 figs., 29 refs.

Visual-spatial agnosia has been reported with lesions in one cerebral hemisphere, usually the right, but the significance of the major or minor hemisphere for the location of visual-spatial cognition is uncertain, as is the significance of topographical disorientation, visual defect, or neglect of the left half of visual space.

A study has been made of 8 cases of right-sided lesions with visual-spatial disorganization. There was no dysphasia or left-handedness; most of the lesions were tumours, and some meningiomata were later removed. The chief findings were visual-field defects in all but one case, neglect of the left half of the visual field in 6, some oculomotor defect in 6, marked difficulty in dressing in 4, and some confusion of right and left in 3 cases. All patients showed disorder of appreciation of space-relationships and in the execution of tasks under visual control. Five patients had topographical disorientation and 4 showed marked loss of topographical memory. There was some intellectual impairment in 6 cases. Special tests used included cube analysis, copying and drawing, assembly of block designs, and drawing of maps and ground plans.

The dressing apraxia and part of the constructional defect, but not the topographical disturbances, can be accounted for by neglect of the left half of the visual space. The role of the minor hemisphere is discussed. A comparative study of left-sided lesions will follow.

Gwenvıon M. Griffiths

2568. **Further Experiences in Treatment of Septic Meningitis with Bacitracin**

P. TENG. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 861–877, Dec., 1950. 8 refs.

The active principle of bacitracin is produced by a strain of *Bacillus subtilis*; the antibiotic has a wide antibacterial spectrum including most strains of streptococci (haemolytic and non-haemolytic), coagulase-positive staphylococci, pneumococci, the anaerobic cocci in general, the gas-gangrene group of organisms, spirochaetes, and *Entamoeba histolytica*. After intramuscular injection into animals, small amounts of bacitracin are found in the cerebrospinal fluid; in the presence of meningitis much higher concentrations are obtained. Intracisternal and intrathecal injection of from 5,000 to 20,000 units of bacitracin in 3 to 5 ml. of isotonic saline solution twice daily for 2 weeks produces no ill-effects. Even 50,000 units in a single dose does no harm. Its action is not inhibited by serum, pus, or penicillinase. Some impure preparations irritate the kidneys when administered intramuscularly, but the present purified product is almost free from this fault.

The author treated 13 cases of purulent meningitis due to organisms resistant to penicillin and/or other antibiotics. One case had previously failed to respond to as much as 16,000,000 units of penicillin daily. The dose of bacitracin used was variable, ranging from 5,000 to 20,000 units daily by intracerebral and intraspinal injection, together with 10,000 units intramuscularly every 6 hours. The intrathecal and intraventricular injections were given in a solution of isotonic saline, usually containing 1,000 units to 1 ml., though sometimes this concentration was reduced and at other times increased. The treatment was continued for up to 23 days, and in one case bacitracin was given intramuscularly for 38 days. Nine of the 13 patients recovered; of the 4 patients who died, 1 had a pineal tumour, 1 died from extensive cerebral infarction, 1 from multiple brain abscesses, and 1 from brain abscess (undisclosed) with bronchopneumonia and cardiac failure.

[This is an interesting addition to the recorded successes of bacitracin treatment, but the author is rather vague about the best treatment pattern. However, he includes a table of suggested dosages, graded according to age, for the various routes of injection, but excluding the intramuscular route.]

L. A. Liversedge

Psychiatry

2569. **Effects of ACTH in Patients with Mental Disease**
M. D. ALTSCHULE, E. PROMISEL, B. H. PARKHURST, and H. GRUNEBAUM. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 641–649, Nov., 1950. 6 figs., 17 refs.

This investigation was prompted by the work of Pincus and Hoagland, which suggested that in schizophrenia the adrenal cortex does not respond normally to stimulation by adrenocorticotrophic hormone (ACTH), and that of Gildea and others, which suggested that the response is normal.

The effects of ACTH on adrenal cortical function, as measured by eosinophil counts, the urinary uric acid: creatinine ratio, 17-ketosteroid excretion, and sweat sodium concentration, was the same in psychotic patients as in normal persons. When, however, 100 g. of dextrose was given 1 hour after a single injection of 25 mg. of ACTH, there was a greater rise in the blood sugar level over a 3-hour period in psychotics than in normal persons. It is admitted that the numbers studied were so small that chance may have dictated the difference found in the two groups.

It is known that large doses of ACTH or cortisone may give rise to mental changes in persons previously normal mentally. The authors report 2 cases, both patients being manic depressives, in which the condition deteriorated after administration, in one case of 570 mg. of ACTH in 17 days, and in the other of 900 mg. in 10 days. The history is also recorded of 5 patients previously given insulin or electric convulsion therapy who showed evidence of lessened responsiveness to ACTH.

It is suggested, therefore, [on rather dubious evidence] that psychotic patients show exaggerated metabolic changes after administration of ACTH, and that it might be possible to relate psychosis to metabolic changes consequent on an unusual response of the adrenal cortex to ACTH, or of other tissues to cortical hormone released during ordinary stress. *W. V. Wadsworth*

2570. **The Psychological Problem of Time Estimation and the Experimental Demonstration of its Applicability in the Diagnosis of Senile Dementia and in Tumours and Injuries of the Brain.** (Das psychologische Problem der Zeitschätzung und der experimentelle Nachweis seiner diagnostischen Andwendbarkeit bei senilen Demenzen, Hirntumoren sowie traumatischen Hirnschädigungen)
T. KOHLMANN. *Wiener Zeitschrift für Nervenheilkunde* [*Wien. Z. Nervenheilk.*] **3**, 241–260, 1950. 6 figs., 26 refs.

After a short review of the phenomenon of time estimation from the philosophical and psychological points of view, a practical method for clinical testing is described. Various time intervals are measured by a vocal signal at the start and the end of exposure and are controlled by a stop-watch. The person under examination is required first to estimate the relative time (subjective estimation), and then to repeat the same experiment by himself (objective estimation). Three groups have been tested: (*a*) normal individuals; (*b*) cases of senile dementia (4), of brain tumour (5), of carbon monoxide poisoning (1), and a mildly defective case of schizophrenia; and (*c*) a group of 30 subjects who suffered from commotio cerebri. The most marked disorder of time estimation was present in senile dementia, in lesser degree in brain tumours with some mental deficit and in cases of commotio. The degree of the disturbance of time estimation seemed to be in accurate correlation with the brain damage. The " objective " testing method proved more reliable than the " subjective ", especially as a help in differential diagnosis.
F. F. Kino

2571. **Withdrawal Symptoms of Barbiturate Addiction. A Little-known Syndrome**
B. DITURI and L. H. GILMAN. *Journal of the Philadelphia General Hospital* [*J. Philad. gen. Hosp.*] **2**, 2–5, Jan., 1951. 3 refs.

When barbiturates have been administered over long periods they may become drugs of addiction, and in this short paper the importance of recognizing the symptoms which follow withdrawal is stressed. A case is described illustrating the symptomatology in such cases, and 2 further case histories from the hospital records are given. Among the symptoms which may appear during the first day are apprehension, weakness, tremors, abdominal cramps, vomiting, insomnia, and postural hypotension. After 16 hours and during the next few days there may be one or more grand mal convulsions, and psychosis with disorientation, confusion, and hallucinations. High-voltage waves of high frequency may be noted in the electroencephalogram.

The fact that withdrawal symptoms occur following the long-continued administration of barbiturates suggests that these drugs may produce very real addiction.
J. B. Wilson

2572. **Lobotomy in the Management of Intractable Pain and Narcotic Addiction**
E. A. SMOLIK. *Diseases of the Nervous System* [*Dis. nerv. Syst.*] **11**, 327–331, Nov., 1950. 2 figs., 10 refs.

In this report from St. Louis University School of Medicine the author presents the results of lobotomy for the relief of intractable pain in 20 patients, 7 of whom were suffering from non-malignant disease and 13 from malignant disease.

Of the non-malignant group the results are described as " good " in 4 cases, " poor " in 2, and " doubtful " in 1. For the malignant group the corresponding figures are 10, 2, and 1. In the former group good results were obtained in cases of demyelinating disease of the nervous system and tabes dorsalis, while poor results were

obtained in 2 cases of trigeminal neuralgia. The patients in the latter group were suffering from carcinoma of various viscera with metastases, and although in most cases the physical pain was relieved, the most striking result was the relief of the mental agony. In all cases where pain was relieved the demands of the patient for heavy narcotic medication ceased. Even when pain was not abolished the patient became indifferent to it and was able to take part again in other activities. Emphasis is laid, however, on the necessity of using the operation only as a last resort. *J. P. Dewsbery*

2573. **The Central Nervous System during Insulin Shock, with Special Reference to Structural Activity Changes of the Nerve Cells. An Experimental Histological Study.** [In English]
K. A. LORENTZEN. *Acta Psychiatrica et Neurologica* [*Acta psychiat., Kbh.*] Suppl. 64, 1–83. 1950. 37 figs., bibliography.

2574. **Temperature Regulation in Schizophrenia. I. Comparison of Schizophrenic and Normal Subjects. II. Analysis by Duration of Psychosis**
C. W. BUCK, H. B. CARSCALLEN, and G. E. HOBBS. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 828–842, Dec., 1950. 8 figs., 9 refs.

The authors have recorded the diurnal rectal temperature every 4 hours for 4 days in 40 schizophrenic patients, of whom only 2 were females. The median age of the group was 32 years. The results were compared with those obtained in 10 healthy male volunteers of a median age of 29 years. The normal records showed that the mean highest temperature of between 99° and 100° F. (37·2 to 37·8° C.), occurred at approximately 4 p.m., and the mean lowest temperature, of between 97° and 98° F. (36·1 to 36·7° C.), approximately 12 hours later. The schizophrenic patients showed a flat temperature cycle, a type irregular both in the extent of the swing and the timing, and a type with broad swing with abrupt changes, and gave lower values than controls for the mean daily range and for the difference between the day and night temperatures, while a considerable number of minimum temperatures occurred in the late afternoon, and of maximum temperatures in the early morning.

The rectal temperature was recorded in 16 healthy male volunteers and 34 schizophrenics while in a bath for 2 hours, the temperature rising to 102° F. (38·8° C.), or falling to between 60° and 70° F. (15·8° to 21·5° C.). The response to the hot bath was similar in the patients and the controls. In the cold bath the healthy volunteers showed a progressive fall in temperature. The schizophrenics showed three types of reaction: (1) a slight fall, then an elevation; (2) a steady level with two small rises; and (3) a compensatory rise during the bath.

The diurnal temperature cycle was recorded in a total of 76 schizophrenics and compared with the duration of illness. The lowest values occurred in the patients whose illness was of 2 to 4 years' duration. Those with shorter and longer duration of illness differed from the normal only in the differences between the day and night records.

The homeostatic autonomic function, as illustrated by temperature regulation, appears to pass through stages comparable to those of the disease. In the early insidious stage the disturbance is minimal; in the stage of maximal behaviour disorder the disturbance is maximal, and in the stage of emotional blunting it again becomes less. *G. de M. Rudolf*

2575. **A Centenarian Studied by means of Rorschach's Test.** (Un centenaire étudié au moyen du test de Rorschach)
C. RIZZO. *Archives Internationales de Neurologie* [*Arch. int. Neurol.*] **69**, 164–169, Dec., 1950.

The Rorschach test was applied to 34 elderly men, 65 to 90 years of age. In general, it was found that productivity in the aged was reduced, originality diminished; but the synthesizing capacity and mind-control were more marked, the range of interests was diminished, and the critical sense less acute; mental activity was found to be less abundant, whereas psychic activity was more noticeable. These observations led the author to the conclusion that mental processes in aged persons differ even quantitatively from those in dementia senilis, and old age is not necessarily connected with involutionary psychoses.

Very different results were, however, obtained in a centenarian. According to Rorschach three main psychodiagnostic symptoms can be found in the aged: coarctation of experience type, unclear forms, and marked stereotypy. In the case investigated there was a high percentage of clear form responses, the A% was very low, and stereotypy was present in the form of a great number of Hd responses (47%). Coarctation of experience type was certainly present. An unusual finding was the very great number of Do responses, also observed in epileptics and feeble-minded subjects. This, according to the author, means a difficulty in integration; it explains the fact that the different parts of the " human body " are given in separate responses rather than in a single organized response. The Do percentage indicates, however, a very early psycho-involutive process only. *Catherine Schöpflin*

2576. **A Rorschach Study of a Group of Medical Students**
H. B. MOLISH, E. E. MOLISH, and C. B. THOMAS. *Psychiatric Quarterly* [*Psychiat. Quart.*] **24**, 744–747, 1950. 30 refs.

In the Department of Preventive Medicine, Johns Hopkins University, Baltimore, a statistical analysis has been made of the Rorschach ink-blot patterns of 60 healthy fourth-year medical students as a preliminary part of an investigation to determine the hereditary and physiological and psychological characteristics which may precede the appearance of hypertension and coronary artery disease. The responses showed certain differences from those given by other groups of adults of superior intelligence. The medical students tended to

concentrate on tiny details in the blots whereas their responses to the white, the shaded, and the coloured areas were unusual. Possible explanations for the unusual responses of this professional sample are discussed. [However, the explanations tend to be invalidated by the fact that 21 other members of the class, perhaps less conscientious, either refused, or were unable, to take part in the experiment.] *Hunter Gillies*

2577. **The "Chronic Rheumatic" and his Pains. Psychosomatic Aspects of Chronic Non-articular Rheumatism**
P. ELLMAN and D. SHAW. *Annals of the Rheumatic Diseases* [*Ann. rheum. Dis.*] **9**, 341–357, Dec., 1950. 31 refs.

An examination was made of 109 patients with chronic non-articular rheumatism, 78 women and 31 men, ranging in age from 19 to 68 years. Physical abnormalities were found in a few only, and were not considered a sufficient cause of the symptoms. A group of 58 controls (34 men and 24 women) were examined in the same way. The principal symptoms in the rheumatic group were pain and stiffness. Sixteen patients complained of more or less generalized pain. In the group as a whole, symptoms were either not relieved by physiotherapy or were made worse by it. A complaint of depression was made by 49 patients, of sleeplessness by 32, and of fatigue by 26; other symptoms were headache, irritability, and "jumpiness".

A family history of nervous illness was found in 49% of the patients (P group) and 14% of the controls (C group): 48% of P group gave a history of nervous instability, as compared with 21% of C group. An emotionally disturbing event preceded the onset of symptoms in 27% of P group and 11% of C group. Personality disorders in the P group fell into four categories: obsessional personality (51), the energetic, "keep-fit" type (16), the self-assertive and driving (9), and the hysterical (10). Twenty-three were classed as normal personalities. The patients were graded on the Culpin–Smith scale for the evaluation of nervous symptoms; 87 were rated as having a significant score, the two largest classes being anxiety states (56) and depressive states (14).

In 48% of the P group there was a family history of rheumatism, as compared with 11% of C group, and rheumatism with neurotic or psychotic illness was found in the family history of 27% of P group and none of C group. It is inferred that genetic predisposition is important in determining the "choice of symptom"; "psychological infection" from a parent or sibling to whom the patient is strongly attached may also have some influence. Another factor determining location is the diagnosis of rheumatic disorder in the patient himself, whether this is well-founded or not (16% of P group and 8% of C group).

[This contribution to the understanding of a common and important disorder is especially welcome since it is made by observers with long experience in a special rheumatism unit. One minor issue which is open to debate is that of nomenclature. It is arguable that this condition belongs to the class of psychosomatic disorders rather than to the class of neuroses; in the former the focus for the expression of tension is in a different area, and the two classes are distinguishable by their psychometric characters (Kaldegg, *J. ment. Sci.*, 1950, **96**, 908).] *Desmond O'Neill*

2578. **The Personality of Dyspeptics, with Special Reference to Gastric and Duodenal Ulcer**
M. HAMILTON. *British Journal of Medical Psychology* [*Brit. J. med. Psychol.*] **23**, 182–198, 1950. 35 refs.

The results of a personality inventory on four groups of 50 subjects each are analysed; the groups were: patients with duodenal ulcer (DU), gastric ulcer (GU), non-ulcer dyspepsia (NU), and controls (C). All were males between 20 and 65 years of age, and the groups were matched for age distribution in each five-year period. The inventory was drawn up by extracting a list of traits from the literature on personality in peptic ulcer, and items were designed to cover these. The items were not in question form, and the patient was merely asked to indicate what he thought, felt, or did in certain given situations, marking one out of five alternatives of frequency or intensity. The findings were analysed by the method of multiple group discriminants. The first discriminant sharply contrasted the NU group with the controls, the DU group being close to the former and the GU group about half-way towards the controls. The meaning of this finding is that a group of traits dominated by anxiety, dependence, and guilt was found in highest degree in the non-ulcer dyspeptics, with the duodenal-ulcer group fairly close to this, and the gastric-ulcer group half-way between the latter and the controls. This difference was clearly significant; the other differences found were not.

The groups were also compared as regards age, marital state, the number of children, the social group and the father's social group, the type of work, length of illness, age at onset of illness, position in relation to any siblings, and effect of worry upon the symptoms. No significant differences were found. A simple body index was used to estimate bodily habitus; it was concluded that dyspeptics had a narrower body build than controls, the GU group being the narrowest and the DU group the least narrow. The DU patients did not differ in this respect significantly from controls, but did differ significantly from the GU group between the 5 and 1% levels. The NU group differed significantly from controls.

[Not everyone will be able to follow the author through his statistical labyrinth.] *Desmond O'Neill*

2579. **Psychophysiologic Relationship of Asthma and Urticaria to Mental Illness**
D. H. FUNKENSTEIN. *Psychosomatic Medicine* [*Pyschosom. Med.*] **12**, 377–385, Nov.–Dec., 1950. 7 figs., 25 refs.

It is known that asthma and mental illness may alternate with one another, and several forms of this alternation have been reported in the literature. In the present paper the case records are given of 5 patients whose asthma ceased during a mental illness. Functional tests of the autonomic nervous system were carried out,

the blood-pressure response to adrenaline and "mecholyl" being used as an indicator. The responses were classified according to categories described by the author and his collaborators in earlier papers. A patient whose asthma occurred only in association with acute anxiety attacks and another who had urticaria during a psychosis were also tested.

The first patient was admitted to hospital for psychological treatment of severe asthma. She failed to improve and was given electric convulsion therapy (E.C.T.). After 6 shocks she developed a paranoid psychosis, lasting for 4 weeks, and for this period was free from asthma; when she recovered from the psychosis the asthma returned. When she was admitted, adrenaline caused moderate elevation of blood pressure and mecholyl caused a marked and sustained fall, with a severe attack of asthma. During the phase of psychosis the pattern of response was quite different. A greater rise in blood pressure followed adrenaline, and mecholyl caused only a brief depression in blood pressure and a mild asthmatic attack. On recovery from the psychosis the autonomic response reverted to its former pattern.

The responses of the other patients are described. In general, the parasympathetic effects of mecholyl in patients free from asthma were slight and quickly overcome; in the presence of asthma mecholyl caused a marked and prolonged fall in blood pressure and severe asthmatic attacks. One patient had urticaria during a schizophrenic pyschosis. At this time mecholyl caused a sustained fall in blood pressure, severe anxiety, and urticaria. The patient recovered from the psychosis with treatment, and the response to mecholyl was then a slight fall in blood pressure only, with no anxiety and no urticaria. *Desmond O'Neill*

TREATMENT

2580. **Clinico-anatomical Study of a Successful Leucotomy**

S. D. McGRATH. *Lancet* [*Lancet*] **1**, 385–387, Feb. 17, 1951. 2 figs., 7 refs.

The author describes the clinical and post-mortem findings in a woman whose typical paranoid schizophrenia had lasted for 11 years and who had been a patient in Crichton Royal Hospital, Dumfries, for 6 years where, in 1943, a standard prefrontal leucotomy was carried out. Thorough courses of insulin coma and electric convulsion treatment had produced only transient improvement. Following the operation steady improvement took place and she was discharged from hospital in 1944. Her delusions had disappeared quickly, her auditory hallucinations gradually receded, and finally she was possessed of full insight. After some initial difficulty in retaining employment, she secured the post of secretary to the out-patient department of a London teaching hospital. It was while thus employed that she died of a coronary thrombosis in 1948 at the age of 50.

Fortunately, the author was able to make a complete neuropathological examination of the brain at the Department of Neuropathology of the Maudsley Hospital, London. He describes, with diagrams, extensive retrograde degeneration of the dorsomedial nucleus of the thalamus and he points out that the case, in its clinical and post-mortem aspects, supports the contention that the amount of prefrontal cortex isolated from the thalamus should be directly proportional to the severity of the psychosis. He stresses the scientific importance of expert examination of the brains of patients in whom leucotomy has been performed.

Hunter Gillies

2581. **One Operation Cures Three People. Effect of Prefrontal Leukotomy on a Case of *Folie à Deux et Demie***

M. PARTRIDGE. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **64**, 792–796, Dec., 1950.

A woman aged 60, who suffered from depression with a delusion that insects were on her head, was treated by electroplexy, which caused her to believe that the insects had been electrocuted. Within a year of discharge from hospital the original delusions returned in full. Prefrontal leucotomy was performed at St. George's Hospital, London, and 2 years later she was cheerful but still believed that the insects had been the original cause of the trouble.

The husband believed in the presence of the insects, but the grown-up daughter's belief was equivocal. After leucotomy on the patient, the husband stated that he had never believed his wife's statements, and the daughter remarked she had been in doubt, but now knew that her mother had been deluded. *G. de M. Rudolf*

2582. **Further Observations on the Use of Combined Photic and Chemically Induced Cortical Dysrhythmia in Psychiatry**

P. M. O'FLANAGAN, J. I. TIMOTHY, and H. G. GIBSON. *Journal of Mental Science* [*J. ment. Sci.*] **97**, 174–190, Jan., 1951. 5 figs., 19 refs.

The authors, working at Hill End Hospital, St. Albans, treated 35 patients with 0·1 to 0·8 ml. of 5% leptazol, injected slowly intravenously, insufficient being injected to produce subjective experiences or alteration in the electrocencephalogram (EEG) except in combination with intermittent photic stimulation of the closed eyes by means of a stroboscopic lamp with flash frequency of 10 to 30 per second. This was applied for periods of not more than 15 seconds, producing a myoclonic response in the facial muscles which usually spread rapidly to the arms, and would, with prolonged stimulation, become generalized. Photic stimulation was repeated over a total period of 5 to 10 minutes, during which the patient remained conscious and was not unduly distressed. Sensations during treatment consisted of pain, alarming palpitations, fear, terrifying "electric shock", seeing coloured patterns, dryness of mouth, sensation of being frozen or of pleasurable warmth, an urge to cry out, and nightmares. The EEG records obtained were typical of those of grand or petit mal. About 30% returned immediately to the resting record between applications of the lamp. Single myoclonic twitches were accompanied by a single spike

followed by one or more slow waves, prolonged myoclonus by many spikes.

In 6 cases the blood sugar level was recorded up to 1½ hours after myoclonus; in 5 it showed a rise above the fasting level. Treatment was given to 13 patients with depressive syndromes, 7 with schizophrenia, 3 cases of organic syndromes, 3 of psychopathic personality, 3 of anxiety state, 2 of hysteria, 2 of depersonalization, 1 of obsessional state, and 1 of epilepsy. One patient was relieved of depersonalization symptoms, but the most notable improvement was observed in depressives and in one hebephrenic who was greatly relieved after 25 treatments. As the treatment was given from once daily to 3 times weekly, this last case was under treatment for at least 3 weeks.

[In the absence of any statement of the number of improvements from this treatment in 35 cases over a period of 12 months, no conclusions can be drawn as to its value.] *G. de M. Rudolf*

2583. **Photo-shock. A New Form of Convulsion Therapy.** (Un procédé nouveau de convulsothérapie: le photo-choc)
H. CASTAUT, J. CORRIOL, J. BERT, and A. MERLAND. *Encéphale* [*Encéphale*] **39**, 554–567, 1950. 3 refs.

By means of a method of combined leptazol and photic stimulation, cerebral dysrhythmia is induced in the thalamo-cortical system. Leptazol acts electively on the thalamus, while photic stimulation produces neuronal discharges starting in the lateral geniculate body and spreading thence into the optical cortex. While the leptazol effect is still subliminal, the intermittent photic stimulation provokes an intense discharge activity in the thalamo-cortical system, as a result of which the superior cortical processes of integration are abolished. Thus the experience of anxiety connected with the leptazol shock is eliminated, the patients being rendered completely amnesic.

The method consists in giving approximately 6 ml. of a 10% solution of leptazol intravenously as rapidly as possible, this dose being repeated if necessary. Before the injection photic stimulation is applied. The light is derived from a stroboscope at a flash frequency of 15 per second. The stimulus is applied to closed eyes. At the end of the injection there is usually immediately a myoclonic response, which precedes the tonic phase of the convulsion. The light stimulus is maintained until the second clonic phase occurs. Electroencephalography shows the same recordings as in genuine epilepsy. The authors have given 500 " photo-shocks " so far, with no ill-effects. Contraindications are the same as for other forms of shock therapy. Although the number of patients treated by this method to date is too small to assess the full therapeutic value of the treatment (51 female patients have been treated in a mental hospital in Bouches-du-Rhône), it seems that it is superior to electric convulsion therapy in certain forms of schizophrenia and in confusional states. In depressive syndromes it seems to be less effective.

It is suggested that the photo-shock, while acting essentially on the thalamic formations and their cortical connexions, affects the circular activity in the reverberatory structures. If the views of the cybérneticians are accepted that mental diseases are fundamentally diseases of the memory, the photic stimulation acts on the " circulatory memory " while leaving the " permanent memory " unaffected.

[O'Flanagan and his colleagues have reported experiences with the same method (see Abstract 2582).] *Catherine Schöpflin*

2584. **Evaluation of Vitamin E Therapy in Psychiatric Disorders**
S. STONE. *Diseases of the Nervous System* [*Dis. nerv. Sys.*] **11**, 355–361, Dec., 1950. 43 refs.

An attempt was made to evaluate the therapeutic efficacy of α-tocopherol administration during the past 12 years to over 2,800 patients. Since 1940, concentrates of natural mixed tocopherols in 50-mg. capsules have been used, the dose varying between one every other day and three a day. Side-effects included dizziness, lichenoid skin eruptions, and an exaggeration in one case of existing psoriasis. The general reaction to tocopherol was similar to that after administration of analeptic drugs such as amphetamine, but usually did not become apparent for 3 to 8 days. In involutional melancholia it is suggested that there was an improvement in the general well-being of the patients, but its effects on the vasomotor symptoms of the menopause were not impressive. There was the impression that in affective states recovery, though gradual, was hastened, and that tocopherol had a synergistic effect with convulsive therapy.

In the arteriosclerotic senile group, when treatment was combined with administration of Lugol's solution, three drops three times daily, there was improvement with a sense of well-being, reduction of irritability, and more alertness. The tocopherols were found to be of definite value as an adjuvant treatment in cases of psychomotor epilepsy when used in combination with anticonvulsant therapy. Patients with migrainous headaches responded favourably. The author found tocopherol therapy of greatest value in the psychoneuroses. Gastric distress was relieved in cases of alcoholism when 50 to 100 mg. of mixed tocopherols was administered as a routine. *W. V. Wadsworth*

2585. **The Treatment of Manic Depressive Patients with Lumbar Procaine Block.** (Лечение паниакально-депрессивных поясничной новокаиновой блокадой)
V. P. PROTOPOPOV, P. V. BIRIUKOVITCH, and S. D. RASIN. Невропатология и Психиатрия [*Nevropat. Psikhiat.*] **19**, No. 6, 28–35, 1950.

Procaine block of the lumbar sympathetic ganglia and plexuses was used in the treatment of 37 manic depressive patients. The usual dose given was 90 to 120 ml. of the 0·25% solution, and the number of treatments varied from 1 to 8 in each patient. This form of treatment had a definitely beneficial effect on most of the maniacal patients: the psychosis was terminated in 12 cases, and in 21 cases it was improved. Of the 37 patients, 4 were in a depressive phase; on them lumbar block had no therapeutic effect. *L. Crome*

Infectious Diseases

2586. **Immunity in Scrub Typhus: Resistance to Induced Reinfection**
J. E. SMADEL, H. L. LEY, F. H. DIERCKS, and R. TRAUB. *Archives of Pathology* [*Arch. Path.*] **50**, 847–861, Dec., 1950. 5 figs., 13 refs.

Because of the specific curative effect of chloramphenicol or aureomycin in scrub typhus, experiments could be performed on the specificity and persistence of immunity to this disease in human volunteers. They were given intradermal inoculations of a few living *Rickettsia tsutsugamushi*, contracting in consequence an experimental infection closely resembling that produced naturally by the bites of infected mites. Of 8 volunteers who had had scrub typhus 1 to 2 months previously, none contracted the infection, whereas of 16 who had been infected 11 to 25 months before, no fewer than 11 had the disease. Thus, it is evident that an attack of scrub typhus does not induce prolonged natural immunity. The reasons for this are not yet known, but it may be due in part to the fact that several antigenic variants of these organisms are known to exist. *R. Hare*

VIRUS INFECTIONS

2587. **Inclusion Disease or Generalized Salivary Gland Virus Infection**
M. G. SMITH and F. VELLIOS. *Archives of Pathology* [*Arch. Path.*] **50**, 862–884, Dec., 1950. 6 figs., 31 refs.

In this disease the nucleus of the cell is enlarged and the cytoplasm increased in amount. Large intranuclear inclusions surrounded by a clear halo and lying within a distinct nuclear membrane, containing one or more dense chromatin masses, are pathognomic of the disease. These lesions, for the most part, occur in the viscera and particularly in the lungs. They have also been seen in the kidney, liver, spleen, and other organs, and are accompanied by symptoms of blood dyscrasia or hepatic damage: in about one-third of the known cases there was an association with a previous attack of whooping-cough. In all, 69 instances of the disease have been reported, occurring for the most part in the newborn or very young, although one instance of the disease in a child of 13 years is known.

It is probable that the disease is a virus infection because the characteristic lesions closely resemble those seen in salivary-gland virus infections in rodents.

R. Hare

2588. **Poliomyelitis. IV. A Study of the Midbrain**
H. A. MATZKE and A. B. BAKER. *Archives of Neurology and Psychiatry* [*Arch. Neurol. Psychiat., Chicago*] **65**, 1–15, Jan., 1951. 9 figs., 10 refs.

While oculomotor lesions are not uncommon in acute bulbar poliomyelitis, the study of the midbrain has been neglected. A serial study was made in 111 cases. An interstitial inflammatory reaction was present in all cases, and was usually the predominant finding, though rarely as severe as in the medulla in the same case. The reaction was most marked in the tegmental region, with an abrupt lessening at the edge of the cranial nerve nuclei. In a few cases the damage was severe enough to cause necrosis, but where the cranial nuclei were involved the neurone damage was negligible. In 40% of the cases the substantia nigra was affected, the pyramidal tracts being unaffected. Marked nerve cell damage was found, with pyknosis, swelling, ghost cells, and neuronophagia. Change was found in the substantia nigra in 30% of the cases, but usually only about 10% of the cells were involved, in foci of intense inflammatory reaction. The fourth nuclei were unchanged; in 37% the third nucleus showed neurone damage. Change was most frequent in the tegmental nuclei, especially the lateral group. In view of this, it was hoped that some information might be obtained as to the function of this group, but there was no correlation with the autonomic control of respiration or circulation, nor with the reticular cells of the medulla. The acute course of the illness may account for the difficulty in correlation.

Gwenvron M. Griffiths

2589. **Poliomyelitis in the Early Neonatal Period: Report of a Case of Possible Intrauterine Infection**
A. SHELOKOV and L. WEINSTEIN. *Journal of Pediatrics* [*J. Pediat.*] **38**, 80–84, Jan., 1951. 16 refs.

Reviewing the literature, the authors emphasize that pregnant women with poliomyelitis rarely infect their infants. One case of possible intra-uterine infection is described. A woman aged 23 had a respiratory infection followed 3 weeks later by poliomyelitis with generalized paralysis. While in a respirator she gave birth normally to a child who was isolated from her 10 minutes later. At first the child appeared normal, but on the sixth day it passed frequent watery stools, became irritable and slightly cyanosed, and its temperature was 100·4° F. (38° C.). Within 48 hours weakness of both legs was noted, the right becoming completely paralysed; leucocyte count was 18,750 per c.mm. (44% neutrophils). Lumbar and cisternal punctures yielded bloodstained fluid with a xanthochromic supernatant, the ratio of erythrocytes to leucocytes being the same as in the peripheral blood. Two days later cisternal-puncture fluid was bloodstained (with xanthochromic supernatant) but an increased number of leucocytes was present. On that day there was some rigidity of the neck and back. Gradual improvement subsequently occurred except for persistent paralysis of the right leg.

[An incubation period of only 6 days suggests possible intra-uterine infection, but faecal contamination at delivery and exposure to other human contacts cannot be excluded. It would be interesting to know what

significance was attached to the xanthochromic supernatant cerebrospinal fluid in this case.] *Peter Story*

2590. **Isolation of the Virus of Poliomyelitis from the Stools, Oropharynx and Nose of Contacts**
F. M. SCHABEL, A. E. CASEY, W. I. FISHBEIN, and H. T. SMITH. *Journal of Infectious Diseases* [*J. infect. Dis*] **87**, 152–157, Sept.–Oct., 1950. 23 refs.

Comparative examination was made for virus in the stools, pharynx, and nose of poliomyelitis contacts. The subjects consisted of 29 children aged 2½ to 6 years in a nursery school. One child developed paralysis, 2 others signs of meningeal irritation only, while 17 were suspected of having had subclinical poliomyelitis on the basis of clinical observation and examination of the cerebrospinal fluid. Virus was isolated in monkeys from the stools of 21 of the contacts, one of whom had meningeal signs, 14 " subclinical poliomyelitis ", 2 " minor symptoms ", and 4 had no symptoms. Virus was isolated from the pharynx of 6 of the contacts, one with meningeal signs, 3 " subclinical poliomyelitis ", one with " minor symptoms ", and one with none. Virus was isolated from the nose of only one of the contacts. Of a group of 9 non-contact children, one was found to have the virus in the stools.

It is thus clear that a high proportion of children at a susceptible age and in fairly close contact with one another may harbour poliomyelitis virus in the stools, whereas many fewer have the virus in the pharynx or nose. *R. Hare*

2591. **Kaposi's Varicelliform Eruption Treated with Aureomycin**
C. HYMAN. *Annals of Allergy* [*Ann. Allergy*] **8**, 774–776, Nov.–Dec., 1950. 1 fig., 11 refs.

The author describes a case of Kaposi's varicelliform eruption treated with aureomycin. A man of 26, suffering from a long-standing neurodermatitis of the head and neck, developed an influenza-like syndrome with high fever. Soon afterwards a few vesicles appeared on the upper lip which spread over face and upper chest, with swelling of nose, lips, eyes, and ears. Penicillin had no effect, but less than 12 hours after the beginning of aureomycin treatment the temperature returned to normal, the vesicles began to dry, and the scabs fell off. The amount of aureomycin given was 250 mg., hourly for 4 hours, and subsequently 6-hourly for 36 hours.
H. Herxheimer

2592. **Studies on the Sequelae of Acute Infectious Hepatitis**
J. POST, S. GELLIS, and H. J. LINDENAUER. *Annals of Internal Medicine* [*Ann. intern. Med.*] **33**, 1378–1397, Dec., 1950. 5 figs., 26 refs.

This paper from the Veterans Hospital, Bronx, N.Y., records the sequelae in 114 cases of acute infective hepatitis (including 3 cases of homologous serum hepatitis, 2 following injection with yellow-fever vaccine, and one of glandular fever).

The patients were studied over a period of 21 months, their jaundice having occurred up to 4 years previously. Three main types of sequelae were noted: recurrent jaundice with intervening good health in 29, persistent jaundice with 1 to 4 mg. bilirubin per 100 ml. in 9, and prolonged convalescence in 6. The most common symptoms were gastro-intestinal (anorexia, nausea, and upper abdominal pain) and lassitude, while the important physical signs were icterus, hepatomegaly, spider naevi, and splenomegaly in that order of frequency. Raised serum bilirubin level and a positive reaction to the cephalin-flocculation test were the most frequent abnormal laboratory findings. [Neither thymol turbidity nor flocculation was estimated.]

The authors point out that no useful conclusion may be drawn regarding the incidence of sequelae since many cases were referred to them because of their complicated nature. [Their findings also suffer from the fact that liver biopsy was not performed and from absence of proof as to the nature of the original attacks of jaundice.]
Richard Terry

2593. **Encephalomyelitis due to Pasteur Treatment. Report of a Fatal Case with a Review of the Literature**
C. FISCH and D. E. WOOD. *Journal of the Indiana State Medical Association* [*J. Indiana med. Ass.*] **43**, 1197–1201, Dec., 1950. 5 figs., 13 refs.

BACTERIAL INFECTIONS

2594. **Aureomycin and Chloramphenicol in Whooping-cough**
J. D. GRAY. *Lancet* [*Lancet*] **2**, 800–802, Dec. 16, 1950. 3 figs., 3 refs.

The normal course of whooping-cough was established in 82 cases by a count of the paroxysms, made by the mother daily from the start to about the 42nd day of the disease. It is argued that this is a sufficiently accurate method of judging progress. In 38 cases aureomycin was given in a dosage of 50 mg. per kg. body weight, divided into 4-hourly doses, daily for 5 days. Those children over 4 years of age, 10 in number, received capsules, while the remaining 28 received a chocolate–lactose powder with the drug evenly distributed therein. With the latter form there was a rapid fall in the daily cough count, so that by the 22nd day of the disease it had reached the same figure as on the 38th day of the controls. In the case of those given capsules the effects were not so striking. In a few cases the dose was increased to 60 mg. per kg. body weight a day for 5 days and this was thought to be more effective, though there were too few cases for a strict comparison to be made. In both series of cases there was no qualitative change in the cough, which remained hard with whooping and vomiting. The children given the chocolate powder evinced a craving for food, unlike the usual picture in whooping-cough. A further 21 patients were given chloramphenicol in a dosage of 100 mg. per kg. body weight in a single dose daily for 5 days. Again, there was a rapid fall in the cough count, so that on the 23rd day of the disease it had reached the level attained in the controls on the 42nd day. It was observed also that the cough was loose and productive, with no whooping or

vomiting. The author considers, however, that the dosage with both drugs was too low for the best results. Better clinical results might be obtained by increasing the daily dosage of aureomycin to 100 mg. per kg. in divided doses daily for 5 days. It is thought that it would suffice with chloramphenicol to add to the daily single dose of 100 mg. per kg. two maintenance doses, 8 hourly, of 60 mg. for infants, 125 mg. for children from 1 to 3 years, and 250 mg. for those over 3 years of age.

Reginald St. A. Heathcote

2595. **Dysentery Due to Sulfonamide-resistant *Shigella sonnei* Controlled with Chloromycetin**
M. L. COOPER and H. M. KELLER. *American Journal of Diseases of Children* [*Amer. J. Dis. Child.*] **80**, 911–920, Dec., 1950. 6 figs., 12 refs.

Shigella sonnei was isolated from the faeces of 5 patients in a children's hospital who had become acutely ill with fever and diarrhoea. The source of infection was traced to a symptomless carrier among the nursing staff who had had a mild attack of diarrhoea 3 months before the outbreak: 4 of the children and the carrier were treated initially with sulphadiazine by mouth. The therapeutic response to this drug was poor and *Sh. sonnei* persisted in the faeces for an average of 12 days. The other child was given chloramphenicol by mouth and rectally, and after 2 days' therapy the faeces were clear of shigella. Sensitivity tests *in vitro* revealed that the infecting strains were highly resistant to sulphadiazine and sensitive to chloramphenicol. Accordingly, the cases which were refractory to sulphadiazine were treated with chloramphenicol, and within 4 days of the change in therapy *Sh. sonnei* was eliminated permanently from the faeces.

Groups of mice were infected with two of the epidemic strains and were treated with sulphadiazine, sulphapyrazine, or chloramphenicol. The mortality rate was high in the groups treated with the sulphonamide drugs, and was negligible in those given chloramphenicol.

G. B. Forbes

TYPHOID FEVER

2596. **Treatment of Typhoid Fever with Chloramphenicol**
C. F. L. HILL, J. V. ARMSTRONG, C. K. MCDONALD, and E. N. ALLOTT. *Lancet* [*Lancet*] **2**, 802–804, Dec. 16, 1950. 2 figs., 7 refs.

A description is given of 21 cases of typhoid fever, originating from the S.S. *Mooltan*. All were typical and 6 were regarded as mild, 7 as moderately severe, and 8 as severe. There were no deaths and few complications. They were admitted at various times from the start of the disease, from the 4th to the 16th day. All were treated with chloramphenicol as soon as possible after admission; 6 were given an intensive course—an initial dose of 4 g., followed by 2 g. 6-hourly to a total of 20 g. in 48 hours. The remainder had varying periods of treatment (from 9 days upwards), with 4 g. initially, then 3 g. daily until fever ceased, and then 1·5 g. daily, the total amounting to 20 to 35 g. There was a rapid general improvement, both objective and subjective, and fever had gone by the 4th day. The only toxic effect observed was internal ophthalmoplegia, in 4 cases with heavy dosage, which was purely temporary. As in other reported series of cases treated with the drug, there was a large number of relapses (12 out of 21 cases, one relapsing twice). The relapses were severe, and all but one were accompanied by bacteriaemia. No correlation between relapse rate and duration of treatment was found. Again, the day of relapse bore no relation to the time elapsed since the beginning of the illness. Blood levels of chloramphenicol were estimated throughout the series, though some difficulties are described. With the massive doses a level of 0·15 mg. per 100 ml. was recorded in one case, but in most it was about one-half of this figure. Some correlation between blood level and dose per kg. body weight was observed, but there was considerable variation. The blood levels attained on a dosage of 1·5 g. a day were so low as to make it doubtful whether such dosage has any therapeutic value. The authors suggest that the course of treatment should be 3 g. a day till defervescence, 10 days rest, then 3 g. a day for 3 days. It is thought that this course might reduce the relapse rate.

Reginald St. A. Heathcote

2597. **Complications in the Treatment of Typhoid Fever with Chloramphenicol.** (Les accidents du traitement des fièvres typhoïdes par la chloromycétine)
J. REILLY, A. COMPAGNON, P. TOURNIER, R. BASTIN, and H. DU BUIT. *Annales de Médecine* [*Ann. Méd.*] **51**, 597–654, 1950. 8 figs., bibliography.

The authors record the results of a clinical and experimental investigation into the pathology of typhoid fever, with special reference to the occasional deleterious effects observed during the administration of chloramphenicol. Various clinicians have noticed that the striking success which attends the use of chloramphenicol in *Salmonella* infections is sometimes marred by disasters: the patient may suddenly become profoundly collapsed and die in the "typhoid state" although at necropsy it appears that the blood and tissues have been entirely sterilized by the antibiotic. From a striking series of animal experiments planned and executed in a manner worthy of Claude Bernard the authors present the following conclusions.

Therapeutic disasters which may follow too large doses of chloramphenicol are accompanied by pathological changes similar to those found in animals which have been killed by injection of typhoid endotoxin (antigen O)—cardiovascular collapse, nervous prostration, haemorrhagic lesions, and ileus severe enough to simulate perforation. It is therefore probable that in human beings the symptoms are due to a too rapid destruction of bacterial cells. This hypothesis has been tested on the guinea-pig. Injection of *Salm. typhi* into the ileocaecal lymph nodes produces after a day or two appearances characteristic of human typhoid fever. In some cases injection of only a few thousand bacilli followed by oral administration of chloramphenicol brings about death of the animal in a state of collapse in a period of

from 18 to 40 hours. Findings at necropsy are similar to those produced by intravenous injection of typhoid endotoxin. Toxicity of chloramphenicol itself or its solvent can be excluded. (This was shown by the use of an optical isomer similar in structure but devoid of antibiotic properties.)

It is claimed that the same state of affairs occurs in the human body. Liberated endotoxin is powerfully neurotropic, the lesions in the gut being attributable to vasomotor disturbance locally instigated. Proof of this is forthcoming from the fact that organisms other than *Salm. typhi*, such as *Bacterium coli*, when injected into lymph nodes of a guinea-pig produce lesions identical with those of typhoid fever under the influence of chloramphenicol. The critical suddenness of symptoms so produced is evidence that they are due to liberated endotoxin and not to any exotoxin secreted by the bacteria.

It is shown that chloramphenicol administered orally to a dog can be recovered from the thoracic duct in a concentration not less than that in the venous blood. Streptomycin, on the other hand, penetrates lymphatics much less readily. The authors consider this fact of the greatest importance since to cure typhoid fever it is essential that the nidus of infection in mesenteric lymph nodes be eradicated. They describe an experiment in the rabbit in which a single lymph node is severed from its connexion with all lymphatics while its blood supply is kept intact. This node remains infected when others not so treated are rendered sterile. The importance of oral administration is stressed, since by no other means can the lymph-node infection be attacked.

The frequent relapses which have been observed to follow typhoid treatment with chloramphenicol are explained as due to liberated endotoxin causing foci of necrosis which lessen the local sclerosing power of reticulo-endothelial cells engaged in strangling the primary foci of infection. Bacteria are able to survive and once more invade the blood stream when the area of necrosis is recanalized.

The maxim "strike hard" in the treatment of *Salmonella* infections should be modified into "take no undue risk" The preliminary loading dose should be omitted, and treatment with chloramphenicol should be temporarily suspended if any sudden aggravation of symptoms becomes apparent. *Joseph Ellison*

2598. **The Treatment of Typhoid Osteomyelitis with Chloramphenicol**
W. V. MATTEUCCI and W. P. BOGER. *Journal of the Philadelphia General Hospital* [*J. Philad. gen. Hosp.*] **2**, 18–22, Jan., 1951. 5 figs., 5 refs.

The case is reported of a man of 39 with a discharging sinus on the medial aspect of the left knee: 13 years before admission he had suffered from typhoid fever. *Salmonella typhi* was cultured from the wound on three occasions. Chloramphenicol, 1 g., was then administered by mouth every 6 hours, and plasma concentrations 7 to 22 times greater than the concentration required to inhibit growth *in vitro* were obtained. The sinus healed well and, although not closed when the patient left hospital 18 days after the start of chloramphenicol therapy, healing was by then well established and *Salm. typhi* was absent from the discharge. Secondary contaminants were eradicated by means of intramuscular penicillin, and sulphonamides by mouth, and 9 weeks from the commencement of treatment the lesion had healed.

In view of the avascularity of the tissues around the infected part the authors stress the importance of maintaining a plasma level of the drug many times higher than that required to inhibit growth *in vitro*. They suggest that treatment with chloramphenicol should be given adequate trial before operation is performed.
J. B. Wilson

2599. **Chloramphenicol in Progressive Dosage in the Treatment of Hypertoxic Typhoid Fever.** (La chloromycétine à doses progressives dans le traitement des fièvres typhoïdes à forme hypertoxique)
M. E. FARINAUD and L. PORTES. *Presse Médicale* [*Pr. méd.*] **59**, 3–4, Jan. 6, 1951.

From Indo-China the authors report 12 cases of typhoid fever treated with chloramphenicol: 4 patients were treated with the orthodox initial dose of 50 mg. per kg. body weight, followed by similar daily maintenance doses: they died with signs of vascular collapse or cerebral irritation. In subsequent cases, where the length of history or the hypertoxic state of the patient appeared to warrant it, a much lower initial dosage scheme was employed: 15 mg. per kg. divided in four doses during the first day, with a gradual daily increase of 0·5 to 1 g. until the patient became afebrile, followed by maintenance of this dosage, usually about 50 to 60 mg. per kg., for 7 days. Symptomatic treatment with analeptics and deoxycortone was given when indicated. This regimen did not, in the cases reported, delay defervescence, which occurred on the 6th or 7th day of treatment. *W. G. Harding*

TUBERCULOSIS

2600. **Streptomycin Therapy in Chronic Conditions of the Right Iliac Fossa in which Tuberculosis was either Proved or Unproved.** (La streptomycinothérapie dans les affections torpides de la fosse iliaque droite chez des tuberculeux avérés ou non avérés)
J. BAUMEL, E. FASSIO, —. PEDOUSSAUD, and —. CHAMBON. *Acta Gastro-Enterologica Belgica* [*Acta gastro-ent. belg.*] **13**, 691–700, May–June, 1950. 6 figs., 13 refs.

Although streptomycin has been used for several years in the treatment of many forms of tuberculous infection, it is only within the last 2 or 3 years that it has been tried in the treatment of intestinal tuberculosis. Since 1947, workers in the U.S., Switzerland, and France have been investigating the action of streptomycin on tuberculous enteritis. The greatest difficulty lies in establishing beyond doubt the diagnosis of tuberculous infection of the intestine; cases with characteristic gastro-intestinal symptoms or a characteristic radiological picture in addition to a proved pulmonary or extrapulmonary tuberculous lesion may generally be regarded as definite cases of tuberculosis of the intestines.

The cases treated with streptomycin have varied in severity, but nearly all are reported to have improved in every way. Oral therapy has given poor results, and the intramuscular route with a dosage of 1·5 to 2·0 g. daily appears preferable. The combination of streptomycin and operation has been advocated by some workers.

The present authors have recently used streptomycin in the treatment of several of their own cases. Most of these had lesions in the ileo-caecal region with an associated pulmonary tuberculosis, tuberculous diathesis, or some other form of proved tuberculosis. During treatment patients had absolute rest in bed and were given a course of 1 to 2 g. streptomycin daily intramuscularly for about 20 days or more. Streptomycin was most effective when it was used for clear-cut and fully developed intestinal tuberculous lesions. The optimum dose was found to be about 30 to 40 g. and a rapid amelioration of the subjective symptoms was produced. Diarrhoea was reduced or disappeared in a few days; pain was soon relieved; improvement in the general health was equally manifest; temperature fell rapidly to normal; appetite was regained and the weight increased in a remarkable manner. This improvement permitted, in many of the cases, active treatment of the underlying pulmonary lesions. It was even found useful in tuberculous peritonitis with ascites and in intestinal localization with a superadded coliform infection. In a few advanced cases there was no improvement at all. In chronic forms the effect of streptomycin was less marked, although it did cause a slight amelioration of the subjective symptoms. The effect was due either to the anticongestive effect or to its action on the secondary lesions, produced by *Bacterium coli*. Thus streptomycin therapy does not cure every case, the presence of much fibrous tissue in old lesions proving an obstacle to its effect.

The use of streptomycin should be limited in all forms of digestive tuberculosis and particularly in those forms affecting the ileo-caecal-appendicular junction, which are very often mistaken for chronic appendicitis; and it should be used before resistant organisms appear in the tissue surrounding the lesions. *M. Beaton*

2601. **The Significance of Internal Hydrocephalus in Chronic Tuberculous Meningitis.** (Die Bedeutung des Hydrocephalus internus für die chronische Meningitis tuberculosa)
G. Bick. *Zeitschrift für Kinderheilkunde* [*Z. Kinderheilk.*] **69**, 99–132, 1951. 17 figs., 49 refs.

A hydrocephalus of moderate or small size, and sometimes even a severe one, may become stationary in cases of chronic tuberculous meningitis. In a patient given streptomycin early it is more likely to become stationary than in a patient receiving treatment late. Intrathecal streptomycin injections for a prolonged period are more effective than a short course. Infants and children up to 3 years have a greater tendency to develop severe hydrocephalus than older children, and the prognosis is consequently worse. Intrathecal streptomycin in the doses used at the present time does not cause hydrocephalus. In the author's series of 38 children there was no occlusive internal hydrocephalus, that is, the hydrocephalus was always of the communicating kind. In all, 57 air encephalographies were carried out. It is suggested that hydrocephalus is caused not only by a failure of resorption, but also by a hypersecretion of cerebrospinal fluid. Indications for, and contraindications to, the use of encephalography in cases of hydrocephalus are discussed. *Marianna Clark*

2602. **Spinal Arachnoiditis in Tuberculous Meningitis. I. True Incidence. II. Clinical Aspects. III. Pathogenesis and Treatment with Streptomycin.** (I. Sur la fréquence réelle des arachnoïdites spinales dans la tuberculose méningée. II. Aspects cliniques des arachnoïdites spinales au cours de la tuberculose méningée. III. Pathogénie de l'arachnoïdite spinale de la méningite tuberculeuse traitée par la streptomycine. Déductions thérapeutiques)
M. Janbon, L. Bertrand, and J. Salvaing. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **27**, 363–380, Feb. 2, 1951. 13 figs., 44 refs.

These communications from the Streptomycin Therapy Centre in Montpellier deal with various aspects of spinal arachnoiditis arising in a series of 70 cases of proved tuberculous meningitis. The first paper discusses the rarity of reports in the literature of spinal block in tuberculous meningitis before the streptomycin era, and contrasts this with the frequency of such reports since. The authors' own figures are 31 cases (23 proved myelographically) in 70 consecutive cases of tuberculous meningitis.

The second paper deals with the diagnostic triad of tuberculous arachnoiditis. The suggestive findings are: clinical manifestations ranging from spastic or flaccid paraplegia and a Brown–Séquard syndrome to retention of urine (the sole sign in one case). In the cerebrospinal fluid signs include low initial pressure, complete or partial block on jugular compression, yellow fluid with great increase in protein (up to 49 g. per 100 ml.) from the lumbar sac, but less protein in that from the cisterna magna. An oily contrast medium was used to demonstrate myelographically the state of the spinal meninges. Radiological criteria for the existence of arachnoiditis are slowing of the column, fragmentation of the column with arrest of some fragments, deviation of the column to one side of the cord, and complete arrest of the column above or below the block. [Perhaps not everyone would agree as to the significance of the first two appearances, or with the authors' contention that such a procedure is without danger and should be carried out in every case of suspected tuberculous arachnoiditis.] With regard to the time of appearance of the block, in 8 cases it was present from the outset, before any treatment was undertaken, and in 13 cases it appeared during the first 2 months of streptomycin treatment. In the remaining 10 cases the block appeared after the third month of treatment. In 17 cases the spinal block was associated with hydrocephalus. Myelitis involving the central grey matter, secondary to arachnoiditis, was found in only 4 cases. In 3 cases with complicating Pott's disease there was no evidence of direct spread of the disease to

the leptomeninges, nor in cases of gross arachnoiditis of converse spread to the vertebrae. In no case where a block had been demonstrated did repetition of myelography show a return to free passage of the medium, even when all clinical signs of block had disappeared.

The third paper deals with the relation of streptomycin therapy to occurrence of arachnoiditis in tuberculous meningitis. In the 8 cases where block was present before treatment was started the arachnoiditis must be ascribed solely to the tuberculous process. Nevertheless, block appeared in three times as many treated cases, and the irritant or toxic action of streptomycin is well demonstrated by the case of a girl who received in error a dose of 2 g. intrathecally and in whom a flaccid paraplegia and retention of urine developed immediately, though temporarily. However, in all the treated cases coming to necropsy the arachnoiditis was always tuberculous in nature. The authors find it difficult to say, therefore, whether streptomycin aggravates a tuberculous arachnoiditis already present or whether the drug irritates the healthy meninges so as to provide a *locus minoris resistentiae* for the tuberculous process.

J. B. Stanton

2603. **The Effect of Streptomycin on Tuberculous Meningitis. A Pathologic Study**
A. Levinson, J. A. Luhan, W. P. Mavrelis, and H. Herzon. *Journal of Neuropathology and Experimental Neurology* [*J. Neuropath. exp. Neurol.*] **9**, 406–419, Oct., 1950. 12 figs., 9 refs.

The effects of streptomycin on the lesions in 26 cases of tuberculous meningitis, including 16 cases in which life was prolonged a minimum of 35 days, were studied. After prolonged therapy (a minimum of 90 days) advanced healing changes were found in the miliary lesions in the viscera and in the exudate of the meninges. Notwithstanding, there were usually present caseous or incompletely healed miliary foci and similar unhealed foci in the meninges. The mechanism of healing of tuberculous lesions in the meninges and viscera is by a process of diminishing cellularity and progressive fibroplasia.

Frequent features of the brain in streptomycin-treated cases were: (1) Ischemic or necrotic softenings in the rostral basal ganglia on the side opposite the hemiparesis noted in life (31% of cases). (2) Greater incidence of marked degrees of internal hydrocephalus than had been observed in untreated cases. (3) Selective involvement of the stem of the sylvian fissure with a thick granulomatous exudate, within which occurs endarteritis of branches of the middle cerebral artery supplying the basal ganglia, the cause of the ischemic softenings.

Relapse in streptomycin-treated tuberculous meningitis was explained as resulting usually from a repeated miliary dissemination to the meninges from unhealed caseous foci in the body, and occasionally from local breakdown of minute caseous foci within the meninges. Definite healing of meningeal exudate can be effected without resort to intrathecal therapy. The mechanism of healing of the exudate, by the formation of a thick fibrous scar at the base of the brain, associated with endarteritis of arteries traversing the exudate, stands as a pitfall to uncomplicated cure in streptomycin-treated tuberculous menigitis.—[Authors' summary.]

2604. **Trauma and Tuberculosis**
J. Sumner and E. Nassau. *Tubercle* [*Tubercle*] **32**, 33–36, Feb. 1951. 5 refs.

This short article has value as the record of a case in which it is considered that there is an obvious connexion between infliction of trauma and the development of tuberculous spinal disease. The case may be briefly summarized as one of chronic advanced pulmonary tuberculosis in which it had become necessary to advise a thoracoplasty in July, 1948, because of a chronic tuberculous empyema. At that time radiography revealed tuberculosis of the right sacro-iliac joint and partial destruction of the ninth thoracic vertebra. On Sept. 2, 1948, the patient injured his spine, and from that time both pulmonary and non-pulmonary lesions became progressively worse; he died in February, 1949.

There is little doubt that the trauma accelerated the progress of the lesion, and the clinical history of the case may have value where the medico-legal aspect of the relation between trauma and tuberculosis arises.

Frederick Heaf

2605. **Collapse Therapy in Cases of Disseminated Tuberculosis of the Lungs** (Коллапсотерапия диссеминированных форм туберкулеза)
I. D. Zobak. Проблемы Туберкулеза [*Probl. Tuberk.*] No. 1, 27–33, 1951.

The author studied 378 cases of disseminated tuberculosis of the lungs, treated in 289 (63·3%) by artificial pneumothorax. The conclusion reached by the author is that the disseminated forms of tuberculosis of the lungs must be treated with an artifical pneumothorax, especially where there is exudate and destruction of the lung. The incidence of pneumo-pleurisy (26·5%) was the same as in all the other forms. The incidence of operation in cases of bilateral pneumothorax varied between 23% in 1946 and 64·3% in 1948; corresponding limits for unilateral cases were 25 and 32·4%. In 18% of cases it was necessary to apply an artificial pneumothorax to the other side within the first year of treatment.

The author concludes by saying that an artificial pneumothorax in disseminated tuberculosis is a most useful adjunct to other treatment and should at least be tried in all such cases. *H. W. Swann*

2606. **Extrapleural Pneumothorax in the Treatment of Pulmonary Tuberculosis**
E. Murstad. *Lancet* [*Lancet*] **1**, 299–302, Feb. 10, 1951. 3 figs.

The author describes the results of extrapleural pneumothorax in a series of 521 patients. The material is divided into four groups.

Cases in Group (1) were regarded as good risks with a cavity less than 4 cm. in diameter and a vital capacity not less than 2,500 c.cm. In this group there were 107 cases with 2 deaths from pulmonary embolism. Of the 105 surviving patients, sputum became negative

in 101 and remained so for from 1 to 8 years in 89. Group (2) cases were considered to be average risks, with a cavity not greater than 5 cm. in diameter and a minimum vital capacity of 1,300 c.cm. There were 166 patients in this group, of whom 11 died, 6 from pulmonary embolism. Of the 155 survivors, sputum became negative in 127 and remained so for from 1 to 8 years in 112. Group (3) cases were all considered to be poor risks and there were 109 in this group, with 16 deaths. Of the 93 survivors, sputum became negative in 38 and remained so for from 1 to 8 years in 29. Group (4) consisted of a heterogeneous collection of good and poor risks; they were treated by various combinations of extrapleural pneumothorax and thoracoplasty. There were 139 cases in this group, with 13 deaths. Of the 57 patients who underwent bilateral operation, sputum conversion occurred in 41 and 35 were able to work.

Pyogenic infections of the space occurred in 2%, 4%, and 7% of Groups (1), (2), and (3) respectively. The incidence of haemorrhage is not precisely given, though the author estimates that a third of his patients lost more than 2 pints (1·1 litres) of blood from oozing into the space. Operative technique is described. The author advocates leaving 300 ml. of 1% sodium citrate and 50,000 units of penicillin in the space.

[He is obviously an enthusiastic advocate of this form of treatment and, good though his results may be, most British authorities would not agree with his statement that " it gives a more complete and selective collapse than any other procedure ".] *R. H. J. Fanthorpe*

2607. **Air Travel and Pulmonary Tuberculosis.** (Flugzeugbenutzung durch an Lungentuberkulose leidende Patienten)
P. WEILLER. *Tuberkulosearzt* [*Tuberkulosearzt*] **5**, 85–90, Feb., 1951. 17 refs.

The author gives indications for, and contraindications to, air travel by patients suffering from pulmonary tuberculosis. He recommends strict interdiction of air travel for patients with the broncho-pneumonic form, or with caseous and miliary tuberculosis. This also applies to patients who suffer from haemoptysis or have cavities. In cases of fibrotic lung tuberculosis the permission to travel should be dependent upon the extent of the lesions, the *x*-ray appearances, the general state of health, and the haematological findings. Care should be taken in cases of artificial pneumothorax, phrenic avulsion, or thoracoplasty on account of the intrathoracic pressure changes. In cases of artificial pneumothorax air should be withdrawn one or two days before starting the journey, and refilling should be carried out immediately after arrival. Patients with a bilateral pneumothorax should receive the same treatment. *Franz Heimann*

2608. **An Essential Technique; the Identification of the Tubercle Bacillus by Fluorescence Microscopy.** (Une technique qui s'impose: la recherche des B.K. par la microscopie en fluorescence)
A. FRIBOURG-BLANC. *Presse Médicale* [*Pr. méd.*] **58**, 1400–1401, Dec. 16, 1950. 7 refs.

2609. **Studies of 350 Cases of Pulmonary Tuberculosis Treated with Streptomycin.** (Consideraciones sobre 350 enfermos de tuberculosis pulmonar tratados con estreptomicina)
A. N. BRACCO, C. A. PINERO, A. HOWARD, F. J. DEL VALLE, J. TAMINI, and R. CETRÁNGOLO. *Prensa Médica Argentina* [*Prensa méd. argent.*] **37**, 2778–2783, Nov. 17, 1950.

Streptomycin was given to 350 patients with pulmonary tuberculosis. Of these, 22 patients had a primary infection and are not included in this report. The authors stress the difficulties inherent in a study of the effects of any treatment in pulmonary tuberculosis. The cases are divided into bronchogenous, haematogenous, and mixed types. Each of these types is further subdivided into exudative, productive, and mixed types, and in a further subdivision the lesions are classified as progressive, regressive, or unstable.

The effect of the treatment was studied with special reference to symptoms, cavities, and radiological appearance of disease. The dose of streptomycin was 1 g. per day and the total dosage ranged from 20 to 500 g. The results may be summarized as follows:

	Broncho-genous %	Haemato-genous %	Mixed %
Cured	15	24·6	12·9
Improved ..	51	47·5	48·3
Stationary ..	20·6	15·3	25·8
Worse ..	5·6	9·2	6·4
Deaths	6·8	3	6·4

It is concluded that haematogenous forms are most amenable to cure; all three types improved in about equal proportions. Mixed forms were most likely to become stationary during treatment.
J. J. Giraldi

2610. **Unfavourable Clinical Experience with Diplomycin in the Treatment of Pulmonary Tuberculosis.** (Ungünstige klinische Erfahrungen mit Diplomycin in der Behandlung der Lungentuberkulose)
J. WOLF. *Tuberkulosearzt* [*Tuberkulosearzt*] **5**, 91–94, Feb., 1951. 5 refs.

The author used for the treatment of 9 cases of lung tuberculosis an avirulent, Gram-negative strain of diplococcus X 5 which, according to Noster, showed antibiotic effects in laboratory animals and *in vitro* not only against streptococci, pneumococci, and the *Salmonella* group but also against *Mycobacterium tuberculosis*. This diplococcus impedes the growth of tubercle bacilli because of constant production of fermentative substances. The author obtained a similar effect with a pure culture and called the factor " diplomycin ". He was unable to discover any clinical or radiological improvement in his 9 cases after treatment. He is of the opinion that this so-called " antibiotic substance " has no bacteriostatic effect. *Franz Heimann*

2611. **Thiosemicarbazones in the Treatment of Pulmonary Tuberculosis**
R. LIVINGSTONE and E. W. STREET. *Tubercle* [*Tubercle, Lond.*] **32**, 8–14, Jan., 1951. 6 refs.

After referring to German experience of the use of *para*-acetylaminobenzaldehyde thiosemicarbazone (thiacetazone), as given by Hinshaw and McDermott (*Amer. Rev. Tuberc.*, 1950, **61**, 145), the authors report on the results of the administration of thiacetazone in Great Britain to 12 patients with tuberculosis at Lenham Sanatorium. The effective adult dosage is considered to be 150 to 200 mg. a day in the form of 50-mg. tablets by mouth after meals, increasing from 1 tablet to 4 tablets daily within 6 days, and given continuously up to 5 months.

In 3 patients whose lesions were recent and mainly exudative the results were satisfactory; in 7 patients the disease was chronic and little benefit was obtained. In 2 patients tuberculous endobronchitis was present. The result in one of these cases may have been due to streptomycin. In the other case no benefit was obtained. Thiacetazone appears to have an effect similar to that of *para*-aminosalicylic acid (PAS) and it probably can be substituted for PAS in cases of intolerance or PAS resistance. Mild toxic effects such as depression, subjective ocular phenomena, and gastro-intestinal upsets were experienced in the first few weeks of treatment, but in no case did they cause anxiety. The drug caused loss of weight in half the cases.

Although no investigation into the development of thiacetazone resistance by the tubercle bacillus is mentioned here, the authors see no reason why the drug cannot be administered for long periods.

John Sumner

2612. ***para*-Aminosalicylic Acid in the Treatment of Primary Tuberculosis in Infants.** (L'acide para-aminosalicylique dans le traitement de la primo-infection tuberculeuse du jeune enfant)
E. LESNÉ, L. H. LAFAY-COLETSOS, and C. LEFRANÇOIS. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **27**, 331–335, Jan. 30 1951. 6 figs., 26 refs.

The authors have treated 28 children at Brolles Preventorium with *p*-aminosalicylic acid (PAS). Some of the children were admitted with *x*-ray evidence of a primary complex, with or without pleurisy; others developed lesions while at the Preventorium. PAS treatment was given in daily doses of 0·5 to 0·75 g. per kg. body weight, and treatment was continued for 3 to 4 months. The authors report that the general condition improved considerably in the first 2 months of treatment. All the children except one gained weight, and in those who were febrile the temperature came down to normal within 10 days. Where the erythrocyte sedimentation rate was raised it returned to normal fairly rapidly. There was much radiological clearing. Several case histories are given.

[The report would have been more valuable if the authors had given a picture of the course of primary disease in a series of children at this Preventorium before PAS treatment was introduced.] *M. Daniels*

2613. **The Treatment of Tuberculosis with *para*-Aminosalicylic Acid and Simultaneous Administration of Drugs Inhibiting Excretion.** (Tuberkulosebehandlung mit PAS unter Verwendung nierenblockierender Pharmaca)
G. W. LAUENSTEIN and W. ROCKSTROH. *Tuberkulosearzt* [*Tuberkulosearzt*] **5**, 74–80, Feb., 1951. 5 figs.

The authors recommend combined therapy with *p*-aminosalicylic acid (PAS) and streptomycin in the treatment of tuberculous meningitis and exudative phthisis. The dose of streptomycin has to be limited because of its toxicity, but an increase in PAS concentration is possible either by giving it often or by concurrent administration of drugs inhibiting the excretion of PAS through the kidney tubules. The use of such drugs has no influence on streptomycin, which is excreted by glomerular filtration. The authors used caronamide in their experiments, with the result that higher blood levels of PAS could be obtained. Although the oral administration of more than 8 g. caronamide produced in some cases nausea and heartburn, intravenous injection was well tolerated, provided the drug was slowly injected and the solution was alkaline. Intramuscular injection was painful and was refused by the patients. *Franz Heimann*

2614. **The Montreuil Experiment. Considerable Reduction in the Incidence of Primary Tuberculous Infection in a French Town after Two Years' Systematic Vaccination with B.C.G.** (L'expérience de Montreuil. Considérable régression de la morbidité par primo-infection dans une ville française après deux ans de vaccination systématique par le BCG)
M. FOURESTIER, G. BAISSETTE, L. BERGERON, and E. DE SAINT-GERMAIN. *Bulletin de l'Académie Nationale de Médecine* [*Bull. Acad. nat. Méd., Paris*] **134**, 683–691, 1950. 3 figs.

The authors have conducted an intensive B.C.G. campaign in Montreuil, a Parisian suburb of 70,000 inhabitants. All the work was done through the central tuberculosis dispensary. Since October, 1948, "all children and young people" of this town have been tuberculin-tested, and those tuberculin-negative have been offered B.C.G. inoculation: 3,707 school-children (about 70% of those found negative) received B.C.G. vaccine by the scarification method. The authors give the number of cases of primary tuberculosis (*primo-infection-maladie*) seen at the dispensary, and express this as a proportion of the number of children examined at the dispensary. This proportion rose from 6·8% in 1946 to 9·7% in 1948, the year when B.C.G. was introduced in Montreuil, and since then has fallen to 1·5% in the first quarter of 1950. The authors compare these figures with those for the town of Maisons-Alfort, where B.C.G. has not been used extensively and where the corresponding percentage has risen from 2·0 in 1946 to 11·4 in 1950. It is claimed that this is a remarkable demonstration of the value of B.C.G. vaccine.

[The figures are those of the children examined, but there is no indication of how these children were selected. Were they examined because they were ill, or because they were contacts, or because they had become

tuberculin-positive? There are no figures for tuberculous morbidity other than primary disease. Did this also fall rapidly? There is no indication how many of the cases were in vaccinated children, how many in non-vaccinated. Above all, there is no attempt to explain the apparent steep rise in morbidity in Maisons-Alfort from 2 to 11%, at a time when tuberculous mortality was falling rapidly in France and the general tuberculous morbidity was probably stationary. In fact the figure for Maisons-Alfort in 1946 is little higher than that for Montreuil in 1950 after 2 years' systematic vaccination. The figures given obviously constitute a quite unreliable statistical evaluation. The authors conclude that " the comparison between the two towns is blinding "; the reader's vision is certainly obscured, but rather by the veil drawn over quite essential information.]

M. Daniels

2615. **Tuberculous Superinfection after B.C.G. Vaccination.** (Surinfection tuberculeuse après vaccination au BCG)

P. VUILLEUMIER. *Schweizerische Zeitschrift für Tuberkulose* [*Schweiz. Z. Tuberk.*] **7**, 300–312, 1950. 1 fig.

This paper records the follow-up of 79 tuberculin-negative probationer nurses who were vaccinated with B.C.G. by the scarification method and subsequently observed for periods of between 2 and 69 months, with a mean of 30 months. Between one-quarter and one-fifth had reverted to the negative state at the end of the period of observation. The local appearance of tuberculin skin tests repeated throughout the period suggested hypersensitive reactions, probably caused by superadded tuberculous infection, in one-fifth of those observed. Half of those followed up for 3 years or longer (27 in all) were found to become hypersensitive, in one-quarter the intensity remained the same throughout, and one-quarter reverted to the negative state. In a similar group observed at a time when B.C.G. vaccination was not carried out (102 probationers followed up for at least 3 years between 1935 and 1942) one-quarter remained negative, one-quarter again showed an unvaried positive reaction once they had changed, and one-half showed hypersensitive reactions. Only 3·6% of the total group protected with B.C.G. developed some form of tuberculosis, whereas in the pre-B.C.G. group 18·6% became affected. It thus appears that immunization with B.C.G. does not prevent subsequent tuberculous infection, but offers a high degree of protection against its clinical manifestations.

W. G. Harding

2616. **Study of Adolescent Children Inoculated with BCG in Early Infancy**

M. I. LEVINE. *Pediatrics* [*Pediatrics*] **6**, 853–861, Dec., 1950. 12 refs.

Radiographs of the chests of 298 patients between 12 and 23 years of age who had been inoculated with B.C.G. in infancy and of 286 controls of similar age distribution were studied and compared with radiographs taken during the first 5 years of life. All the patients were originally from tuberculous homes. As was to be expected, evidence of healed primary tuberculous lesions was found more commonly in the uninoculated (27) than in the group vaccinated with B.C.G. (since the primary focus is at the site of injection in these cases). Three of the inoculated patients were demonstrated to have a healed primary complex in the lung, but there was reason to believe that the vaccination had been inadequate or unsuccessful in each case; 2 others in the vaccinated group showed evidence of reinfection tuberculosis, and in one of these the response to B.C.G. had been weak and transitory. There were no deaths, and no cases of miliary tuberculosis or meningitis in either group.

This study did not provide any evidence to support the belief that B.C.G. inoculation in infancy reduces tuberculosis morbidity in adolescence, but suggests that re-vaccination whenever the skin reaction becomes negative, and measures to maintain potency of the vaccines, might prove valuable.

M. Baber

2617. **Streptomycin Treatment of Tuberculous Lesions of the Trachea and Bronchi**

MEDICAL RESEARCH COUNCIL STREPTOMYCIN IN TUBERCULOSIS TRIALS COMMITTEE. *Lancet* [*Lancet*] **1**, 253–257, Feb. 3, 1951.

Streptomycin in doses of 1 g. or 2 g. daily for 4 months was given to 35 patients with tuberculosis of the trachea and bronchi. Bronchoscopy was performed before starting treatment and repeated after 2 and 4 months' treatment; in 24 cases it was also performed 2 months after treatment had stopped. The amount of lung disease present varied widely. Healing of the bronchial lesion was less common in the 10 cases with cavitation than in those of more limited lung disease: 15 patients had bronchial stenosis before treatment and 7 developed it during treatment: 2 had granulomatous masses in the lumina of the bronchi, which persisted and were later removed at repeated bronchoscopy. In 24 cases the bronchial lesion was found to be greatly improved or healed at the final bronchoscopy. A satisfactory final result was uncommon if some improvement was not noticed early in treatment. Little difference was noticed in the response to treatment with 1 g. or with 2 g. daily [but the figures are too small to allow of a firm conclusion].

L. M. Franklin

2618. **Incidence of Tuberculin Sensitivity in Hospital Children. Related Mortality**

M. J. LUNN. *Lancet* [*Lancet*] **1**, 370–372, Feb. 17, 1951. 15 refs.

The various surveys of the incidence of tuberculin sensitivity in children have been criticized because the children were from selected groups, were contacts, or were attending chest clinics as suspected cases. The results are here presented of tuberculin testing of 7,555 children aged from 4 weeks to 13 years and suffering from various medical diseases who were admitted to a children's hospital during the period 1940 to 1949. Mantoux testing was carried out with 0·1 ml. of 1 in 5,000 old tuberculin solution, fresh solutions being prepared every 2 weeks. If the reaction was negative, a 1 in 1,000 solution was used, and a 1 in 100 solution if the response was still doubtful. The result of each test

was read by two independent observers 24 and 48 hours later. Of the total, 1,071 children (14·2%) were Mantoux-positive and 5,175 (68·5%) were Mantoux-negative. In 1,309 (17·3%) for various reasons no results were available; however, of this group 1,074 were under one year of age and 83% of these were under 3 months. It may be assumed that at this age the tuberculin sensitivity rate is very low, while the percentage of positive reactors increases with age.

During the 10-year period 37 children, including 27 with tuberculous meningitis, all suffering from acute progressive tuberculosis diagnosed clinically, radiologically, or bacteriologically or confirmed by necropsy, had negative Mantoux reactions. Of this group 33 died during their stay in hospital. It is suggested that the original infection was so massive and the organism so virulent that there was no opportunity to develop sensitivity. In a group of 1,108 " infected children ", that is, those who were either Mantoux-positive, tuberculous and Mantoux-negative, or tuberculous and dying within 48 hours of admission, 251 (22·7%) deaths occurred: 88% of this group showed evidence of meningitis. The mortality was highest during the first year of life (54 out of 87 cases, or 62%).

[It is to be hoped that this survey will be made more complete by a follow-up of the deaths from tuberculosis among the children admitted to the hospital, especially as the mortality rate of 22·7% bears no relation to the mortality from childhood tuberculosis in general and depends entirely upon the type of case admitted.]

Kenneth Marsh

2619. **Postprimary Tumor-like Hilar Lymph Node Tuberculosis in Adults.** (Postprimäre tumorige Tracheobronchialdrüsentuberkulose bei Erwachsenen)
C. STEFANOPOULOS. *Schweizerische Zeitschrift für Tuberkulose* [*Schweiz. Z. Tuberk.*] **7**, 266–274, 1950. 15 figs., 12 refs.

The author reports 6 cases of hilar lymph-node tuberculosis in adults in whom the history and radiological evidence indicated that this lesion was not of primary origin. The pathogenesis of these lesions is discussed.

W. G. Harding

2620. **The Relationship between Tuberculin Reaction and Tuberculous Infection**
S. N. MEYER. *Public Health Reports* [*Publ. Hlth Rep., Wash.*] **66**, 1–15, Jan. 5, 1951. 2 figs., 5 refs.

In three districts near Oslo, 53,000 persons over 14 years old were examined by measuring the induration after 72 hours produced by the standard Norwegian von Pirquet test. Distribution curves of the widths of the induration, drawn for various age groups of each sex, showed in general a U-shape with a peak at 0 mm. and a second at 5 to 8 mm. The minimum between the peaks in the group 15 to 29 years was at 3 to 4 mm. and in the group 40 to 49 years at 1 to 2 mm. This shift was accompanied by a decrease in frequency of 1- to 3-mm. and 0-mm. reactions and an increase in frequency of 4-mm. reactions. This was interpreted as implying that the majority of individuals with 1- to 3-mm.—that is, " non-specific " or " doubtful "—reactions in the lower age groups were not infected. This was borne out by studies in these districts of the frequency of pulmonary calcifications found on radiography in relation to the width of induration of the von Pirquet reaction.

J. E. M. Whitehead

2621. **The Relation between Tuberculosis of the Skin and Primary Infection**
H. J. USTVEDT and I. W. OSTENSEN. *Tubercle* [*Tubercle*] **32**, 36–39, Feb. 1951. 5 refs.

For many years it has been known that silent tuberculous lesions may exist in infected individuals and that there may be a considerable interval between the infection and the manifestation of symptoms, but it was not until Wallgren proclaimed the usual sequence in a time-table of tuberculosis that much attention was given to the subject. In this paper observations are recorded on the interval that elapses between the first available evidence of tuberculous disease and symptoms due to tuberculosis of the skin. The interval is compared with a similar lapse of time between first signs of tuberculous disease and renal tuberculosis or Addison's disease.

The series studied was of 167 cases of skin tuberculosis in which tuberculous disease had appeared before the first skin signs. In a third of the cases the interval was 5 years or less, in a fifth it was 26 years or more. A similar long interval was found in renal tuberculosis and in Addison's disease. The authors put forward very tentatively the hypothesis that deposition of tubercle bacilli in the majority of cases takes place in the skin immediately after the primary infection, and that the bacilli multiply very slowly in the skin without giving rise to clinical tuberculosis for years. The hypothesis is not discussed.

Frederick Heaf

2622. **Blood Volume and Extracellular Fluid in Tuberculosis**
E. B. HAY, C. R. HAY, and D. E. JENKINS. *Journal of Thoracic Surgery* [*J. thorac. Surg.*] **21**, 42–47, Jan., 1951. 3 figs., 17 refs.

In patients with tuberculosis studied there was a reduction in red cell mass, an increase in plasma volume, an increase in extracellular fluid (thiocyanate space), and reduced serum total protein and serum albumin, when compared with the healthy adults. These changes were more marked in those patients who were considered to be in poor condition, by the criteria used.—[Authors' summary.]

2623. **Calciferol in the Treatment of Tuberculous Peritonitis and Chronic Rheumatoid Arthritis.** (Wpływ kalcyferolu na gruźlicze zapalenie otrzewnej i przewlekłe zapalenie stawów)
W. KRÓL. *Polskie Archiwum Medycyny Wewnetrznej* [*Polskie Arch. Med. wewn.*] **20**, 133–137, 1950.

Calciferol was used in the treatment of 8 cases of tuberculous peritonitis and the results were encouraging. It was found that the response to treatment was as good with small doses (3,000 units daily) as with massive

doses (150,000 to 180,000 units daily). Improvement was seen in the patient's general condition, in a fall in erythrocyte sedimentation rate, and in return of body temperature to normal. The blood calcium level rose in all cases irrespective of the dosage; changes in phosphorus and non-protein nitrogen levels were less consistent; in some cases there was a fall in phosphorus level despite hypercalcaemia. The results obtained in 2 cases of chronic rheumatoid arthritis of doubtful tuberculous aetiology were also favourable, especially when calciferol therapy was combined with injections of streptomycin. *J. T. Leyberg*

2624. **Early Surgical Treatment of Tuberculosis of the Hip in Children**
W. M. ROBERTS and F. S. WEBSTER. *Surgery, Gynecology and Obstetrics* [*Surg. Gynec. Obstet.*] **92**, 155–163, Feb., 1951. 4 figs., 12 refs.

The authors have attempted to shorten the healing process in tuberculosis of the hip in childhood by performing surgical fusion as soon as recalcification, as shown by *x*-ray examination, demarcates the lesion. This was generally possible after 1½ to 2 years of conservative treatment. A report is given of 70 operations carried out at an average age of 7·6 years, with solid fusion obtained in 61 (87%), although a second intervention was required in 10 cases: 9 hip-joints did not fuse. The average shortening was 1·8 inches (45·5 mm.), and only 4 patients had as much as 5 inches discrepancy, an incidence of really gross shortening perhaps somewhat lower than in cases treated conservatively for longer periods. The operation was of the extra-articular ilio-femoral type, and localized cold abscesses were not regarded as a contraindication. Patients were allowed to put some weight on the limb a few months afterwards, in plaster, and the average period of immobilization was one year. The authors have been impressed with the frequency of epiphysial degeneration around the knee in cases of tuberculosis of the hip treated for long periods conservatively. They advocate earlier operation in an attempt to avoid this.

[While it is difficult to estimate how successfully this risk has been avoided, the fact that no less than 12 osteotomies were performed for late adduction deformity after fusion suggests that at least in some cases arthrodesis was premature.] *David Le Vay*

2625. **Tuberculosis in Kenya**
W. S. HAYNES. *British Medical Journal* [*Brit. med. J.*] **1**, 67–71, Jan. 13, 1951. 22 refs.

2626. **Conjugal Tuberculosis and its Bearing on the Etiology of the Disease**
W. E. SNELL. *British Journal of Tuberculosis* [*Brit. J. Tuberc.*] **45**, 22–26, Jan., 1951. 10 refs.

During 1940–9, of 835 married or widowed female patients with pulmonary tuberculosis admitted to a home, 68 (8·1%) had husbands in whom tuberculosis had been diagnosed. No fewer than 36 were widows whose husbands had already died of pulmonary tuberculosis, and further investigations suggested that the husband was very often the initial case. However, in this survey 92% of the husbands of tuberculous patients did not themselves have the disease. It cannot be supposed "that this is commonly because they are not infected, but must be due to a high congenital or acquired resistance and/or to favourable environmental conditions". *Kenneth Marsh*

2627. **Tuberculous Glands in the Axilla and Groin**
E. HINDEN, S. G. NARDELL, and S. ANABTAWI. *Tubercle* [*Tubercle, Lond.*] **32**, 2–6, Jan., 1951. 2 figs., 14 refs.

2628. **Non-pulmonary Tuberculosis and Pregnancy**
G. B. GIBSON. *Journal of Obstetrics and Gynaecology of the British Empire* [*J. Obstet. Gynaec. Brit. Emp.*] **57**, 969–978, Dec., 1950. 11 figs., 40 refs.

SPIROCHAETAL INFECTIONS

2629. **Treatment of Tick-borne Relapsing Fever. Neoarsphenamine and Other Remedies**
N. F. COGHILL. *Lancet* [*Lancet*] **1**, 604–605, March 17, 1951. 47 refs.

Neoarsphenamine in the form of a single injection of 0·45 to 0·6 g., or in the same dose given on 2 to 4 occasions at intervals of 5 to 8 days, was given in 82 cases of tick-borne relapsing fever occurring in military personnel stationed in Cyprus during 1942 and 1943. Spirochaetes were found in the peripheral blood before treatment in all but 7 cases, and 63 of the 82 patients were Indians. No severe toxic effects were noted.

With one injection given during the period of fever there was a relapse rate of 50% in 46 cases, with two injections the relapse rate was 38·3% of 13 cases, but with 3 to 4 injections it was reduced to 17·4% in 23 cases. The literature regarding treatment with penicillin, streptomycin, and aureomycin is reviewed.

[The author states that there was a reluctance on the part of medical officers to give multiple injections of neoarsphenamine to Indians on the supposition that they are peculiarly intolerant to arsenic. He states also that the reason for this was not clear. The basis of this fear is the danger of arsenical encephalopathy (Prebble, *Brit. J. vener. Dis.*, 1946, **22**, 93).] *R. R. Willcox*

2630. **Penicillin in Weil's Disease**
A. I. SUCHETT-KAYE. *Lancet* [*Lancet*] **1**, 90–92, Jan. 13, 1951. 8 refs.

The literature concerning Weil's disease treated with penicillin since 1944 is briefly summarized. Clinical details of 6 cases of leptospirosis are given. In all the diagnosis was ultimately proved by agglutination reactions. The effect of penicillin in 3- or 4-hourly doses is to kill the causal organism and to control pyrexia, headache, myalgia, epigastric pain, and apathy. Established renal and hepatic lesions are unaffected, but recovery of liver and kidney function is more rapid in penicillin-treated cases since the survival and multiplication of leptospirae are halted. There were no deaths in the series. In one severe case there was a febrile

reaction following the first dose of penicillin which resembled the Jarisch–Herxheimer reaction of syphilis. It is anticipated that aureomycin will ultimately replace penicillin in the treatment of leptospirosis.

Geoffrey McComas

2631. **The Effect of Orally Administered Aureomycin on *Treponema pertenue* in Man**

K. SCHAEFFER, E. H. LOUGHLIN, and A. JOSEPH. *American Journal of Tropical Medicine* [*Amer. J. trop. Med.*] **31**, 24–25, Jan., 1951. 4 refs.

The phase-contrast microscope was employed to observe the behaviour of *Treponema pertenue* in the yaws lesions of 20 patients treated with aureomycin given either as a single oral dose of 2 g. daily for 5 days, or in doses of 5 g., 3 g., and 2 g. on 3 successive days. The changes observed were identical on the two schedules, but were more rapid following the initial 5-g. dose. In 14 patients the lesions were too dry for scraping at 24 hours but in 6 a few treponemata were observed at this time. In no case were treponemata observed at 48 hours.

The first change was slowing of movements and, although the spiral rotations continued, the organisms became rigid. The spiral rotations then became even slower and the distances between the spirals narrowed, while small nodules or excrescences appeared on the lateral aspects of the spirals. These enlarged and increased in number, and what appeared to be a swelling of the sheath appeared about the treponeme. As the nodulations enlarged and coalesced the treponemata fragmented until only a number of relatively large excrescences remained suspended in a sac provided by the swollen sheath. By this time the organisms had lost all resemblance to treponemata. The process began within 2 hours of the first dose of aureomycin and continued for about 6 hours. *R. R. Willcox*

2632. **Phase Contrast Microscopy for Demonstrations of *Treponema pertenue* in Yaws Lesions**

E. H. LOUGHLIN, A. JOSEPH, and K. SCHAEFFER. *American Journal of Tropical Medicine* [*Amer. J. trop. Med.*] **31**, 26, Jan., 1951.

A Winkel–Zeiss phase-contrast microscope, with a 90× condenser phase ring and a 90× oil-immersion objective, was used to study *Treponema pertenue*.

The treponemata were seen as delicate spiral organisms measuring 14 to 20 μ in length. They have 12 to 6 regular turns and the distance between spirals is about 1μ. During quieter phases they may be observed to have almost straight tapering ends. Normally, however, they are actively motile and constantly rotating on their long axes. They have moderately rapid translational movement, but when debris or cells are encounted they may become temporarily attached and show considerable elasticity, sometimes stretching until the spirals almost disappear. When 2 or 3 meet they may entwine and form an undulating " Y ", or slide along their long axes to appear momentarily as extremely long organisms until they part company. During all of this time spiral movement is maintained.

The dark-field microscope is considered too cumbersome for such work and it fails to provide the definition of structure obtained by the phase-contrast microscope.

R. R. Willcox

2633. **Aureomycin in the Treatment of Yaws**

E. H. LOUGHLIN, A. JOSEPH, and K. SCHAEFFER. *American Journal of Tropical Medicine* [*Amer. J. trop. Med.*] **31**, 20–23, Jan., 1951. 4 refs.

In the course of a study conducted during 1950 at Port-au-Prince, Haiti, 30 West Indians with yaws were treated with aureomycin. All but 5 had primary and/or secondary lesions. Their ages ranged from 7 to 61 years. After it had been found that a total dose of 10 g. would heal the primary and secondary sores, two schedules of treatment with this total dose were evolved. In one aureomycin was given orally in doses of 2 g. once daily for 5 days, and in the other single doses of 5 g., 3 g., and 2 g. were given on each of 3 successive days. Both schedules gave equally good results.

Primary lesions without secondary infection healed by the 4th day, but when deep ulceration was present, healing was sometimes delayed for as long as 14 to 30 days, although the sores rapidly became cleaner and drier. Secondary lesions responded more quickly and were generally healed by the 5th day. Open wet palmar and plantar lesions also rapidly responded, although they took up to 14 days to heal completely, while dry lesions in these sites were rendered painless within 24 to 48 hours. Remarkable improvement was also noted in a woman with yaws arthritis, peri-arthritis, and skin ulceration, dating from childhood, who could only stand in a semi-crouched position before treatment: 8 weeks later she was able to walk without assistance. Other patients with advanced gummata showed striking improvement of function after the healing of lesions. Apart from 2 children who experienced nausea and vomiting no untoward effects were encountered.

In a postscript to the report it is stated that 2 patients later showed infectious relapses but an additional 70 patients had by then been treated on the 5-day schedule. Although the last patient had been treated 3 months previously no further relapses had been observed.

[These findings are in accord with those of Ampofo and Findlay (*Trans. roy. Soc. trop. Med. Hyg.*, 1950, **44**, 311).] *R. R. Willcox*

2634. **The Chancre of Yaws. A Primary Inoculation Lesion.** (Le chancre pianique. Lésion primaire d'inoculation)

M. L. R. MONTEL. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **27**, 453–461, Feb. 10, 1951. 18 figs., 25 refs.

The description of the initial lesion of yaws varies from author to author. This is ascribed to the rarity with which this lesion is seen in its early stages; objections are brought forward to some of the inoculation experiments of the past.

The present author states that experience in Cochin China has convinced him that "if one looks for the primary lesion with care, one will always find it." The

primary lesion, the chancre, is an ulcer, whereas secondary yaws are papillomatous and heal without ulcerating. The chancre is found mostly on the lower limbs. From 10 to 20 days after its appearance it is a circular or oval ulcer, 3 to 6 cm. or more in diameter, with rounded raised edges (" cushions ") which overhang the surrounding skin. It is covered by an adherent crust, underneath which are fleshy, red, non-papillomatous granules. In the centre is a " diphtheroid " membrane. The serous exudate from the lesion contains *Treponema pertenue* in large numbers. On palpation, the base of the chancre is found to be infiltrated but supple. Variations in the form of the chancre include crater-like (with greatly raised borders), vegetative, giant, and multiple types.

One month after its appearance the chancre begins to change: the raised part subsides and the skin edges become raised. The ulcer remains red. When the secondary eruption occurs some chancres are invaded by secondary yaws: these appear to increase the rate of healing and drying. This invasion gives the appearance described as a " mother yaw ". Other chancres are not invaded by the secondary eruption and develop into indolent purulent ulcers with a necrotic base. An allergic reaction is postulated to account for long-standing necrotic ulcers which are often taken for phagedaenic ulcers. The scar of a healed chancre is typical: it is whitish, the skin is atrophic and devoid of hair, sweat glands, and sebaceous glands.

On the basis of 5 biopsies the chancre is described as due to a true ulceration: plasmocytes were present in large numbers in the dermis, together with lymphocytes and polymorphonuclear leucocytes and, especially, eosinophils. The true dermis always showed signs of sclerosis.

[This paper is rather dogmatic and contains one or two minor contradictions, but contains definite ideas which need further investigation.]

W. H. Horner Andrews

FUNGUS INFECTIONS

2635. **Systemic Mycosis Due to *Monilia albicans***
J. V. DUHIG and M. MEAD. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 179–182, Feb. 3, 1951. 6 figs., 19 refs.

Candida albicans (*Monilia albicans*), although a pathogenic fungus, is a frequent commensal in the mouth and intestine and it also occurs in the vagina. Oesophageal thrush (moniliasis) in the newborn is a cause of death chiefly by asphyxia or aspiration pneumonia from regurgitation of food, but, in survivors, pulmonary moniliasis or even generalized moniliasis may follow. In the past there have been few authentic records of systemic moniliasis, but among them have been instances of monilial meningitis or ependymitis, and endocarditis.

The present authors describe 4 cases of fatal systemic moniliasis in infants at the Brisbane General Hospital. All 4 suffered from acute symptoms with vomiting and diarrhoea for which intravenous infusion of glucose-saline was given, and 3 of the children were also given courses of penicillin injections. Two of these 3 and the fourth child developed a condition for which bilateral mastoidectomy was performed. At necropsy all 4 patients presented signs of generalized disease, in some cases marked by pneumonic consolidation, miliary necrotic foci in various organs, and mycotic granulomata or abscesses especially in the kidneys, enteritis, colitis with ulceration and bullous emphysema of the intestinal wall, oral and pharyngeal thrush, and mycotic deposits in the myocardium. *Salmonella* group B was isolated from the intestine of 2 of the children, and *Salmonella* group C from one. *Candida albicans* was isolated from all cases, chiefly from the kidneys, the cardiac muscle, the intestine, and the mouth. Descriptions are given of the histology of the fungal lesions and the morphological and physiological characters of the fungus.

In discussing the causation of the fungus infection the authors consider that the fungus may have been introduced with the glucose-saline infusions although there is no direct evidence of this.

[It is known that moniliasis, local or generalized, may follow the administration of penicillin and other antibiotics to persons who, presumably, already harbour *Candida albicans*. In a recent report Woods, Manning, and Patterson (*J. Amer. med. Ass.*, 1951, **145**, 207) described 25 cases of clinical moniliasis in which the disease appeared to be a direct sequel of antibiotic therapy. It may be significant, therefore, that penicillin had been administered to 3 of the 4 children in the present report.] *J. T. Duncan*

2636. **Treatment of Disseminated Histoplasmosis with Ethyl Vanillate**
A. CHRISTIE, J. G. MIDDLETON, J. C. PETERSON, and D. L. MCVICKAR. *Pediatrics* [*Pediatrics*] **7**, 7–18, Jan., 1951. 4 figs., 6 refs.

A review is given of 18 months' experience of the use of ethyl ester of vanillic acid in the treatment of 12 cases of generalized progressive histoplasmosis. Of these 12 patients, 5 survived and have continued well up to the present. The case reports of all the survivors and 2 of the non-survivors are given in detail. Of the 2 non-survivors, one of them reacted so unfavourably to the drug that it had to be discontinued; the other child could not be adequately treated because of entero-colitis which made it impossible to obtain satisfactory blood levels of ethyl vanillate. With infants the best method of administration is as a 40% solution in olive oil given by gavage. This remains liquid at 37° C. but solidifies at room temperature. The drug should be given at the times of the infant's feeds so far as possible. The oil supplies a large part of the fat required for the feed.

It is suggested that the initial dose should be 0·5 g. per kg. per day divided into 4 or 5 doses and increased in steps of 0·5 g. every 5 to 6 days up to 1·5 g., which gives blood levels of 20 to 30 mg. per 100 ml. Blood levels above 40 mg. per 100 ml. cause undesirable toxic reactions. For adults, less than half the dose used for infants as calculated on a weight basis is indicated, but a better basis for calculating the adult dose is the body surface, and about 5 g. per sq. metre of body surface in 24 hours is recommended as the maximum dosage. If

diarrhoea is present, larger doses are necessary for both age groups. The authors state that "the narrow margin between doses required to give therapeutic levels and those which produce toxic manifestations makes it imperative to have adequate laboratory controls whenever this drug is to be used therapeutically." It is better to take 1 to 2 weeks to work up to therapeutic levels than to attempt to achieve them early.

The authors conclude that, while ethyl vanillate is not an entirely desirable therapeutic agent, it is the only effective drug in disseminated and progressive histoplasmosis so far tried. *B. S. P. Gurney*

RHEUMATIC FEVER

2637. **The Mechanism and Prevention of the Rheumatic State**

W. H. BRADLEY. *Proceedings of the Royal Society of Medicine* [*Proc. roy. Soc. Med.*] **43**, 979–988, Dec., 1950. 2 figs., 31 refs.

The causal factors in rheumatic fever are an infective factor, probably *Streptococcus pyogenes*, acting on a genetically predisposed individual. The inherited factor determines an abnormal response to the infective agent. The abnormality consists in the production of a surfeit of antibody protein, excessive quantities of globulin both in the circulation and interstitially, and a resulting increase in blood volume. Evidence is reviewed bearing on the probability of these conclusions. The author recalls the commonly observed sequence of acute streptococcal sore throat, a lag period of about 2 weeks, then the first attack, or a relapse, of acute rheumatism; a rise in antistreptolysin-O titre is also always observed. He refers to published genealogies suggesting that predisposition to acute rheumatism is transmitted by a recessive autosomal gene.

His own work, published in 1939, showed that at the beginning of rheumatic fever the apparent anaemia is a dilution phenomenon, essentially due to an absolute increase in the circulating plasma volume and not to erythrocyte destruction. The serum was shown to have a high protein content, implying a great increase in total circulating protein. Rather more than twice the normal circulating globulin was present during active rheumatism, and the total circulating albumin tended to be somewhat below normal. The total circulating proteins remain at a high level during the height of rheumatic activity, and fall as the disease becomes quiescent. From this observation it seems improbable that the globulin mobilization is the antibody response to a specific rheumatic infection: for the rise begins before the onset of rheumatism, and does not increase during its course or persist in convalescence.

This leads the author to infer that the streptococcal infection merely fires off a chain of events, and has abated by the time that these events evoke the acute rheumatism. The new factor responsible for the rheumatic state is excess of antibody globulin, abnormal quantitatively and perhaps qualitatively because of the inherited predisposition. It is suggested that cortisone works through its function as an S hormone, affecting the conversion of protein into glycogen, that it has a bearing only on the inherited factor, and that the infective problem remains.

The following suggestions for the prevention of acute rheumatism are made. The children of rheumatic parents should be under the observation of public health officers. They should be housed in single bedrooms, employed in the fresh air and in small communities, nourished adequately, and educated to protect themselves from upper respiratory infection. Chemoprophylaxis should be applied at selected seasons. They should be advised never to marry a rheumatic subject, and to restrict their own families so as to be able to provide each child with a protected environment.

Kenneth Stone

2638. **Observations on the Epidemiology and Aetiology of Acute Rheumatic Fever.** (Zur Epidemiologie und Ätiologie des akuten Rheumatismus)

F. KUSTER. *Zeitschrift für Kinderheilkunde* [*Z. Kinderheilk.*] **69**, 161–178, 1951. 1 fig., bibliography.

The well-defined clinical and histopathological picture of acute rheumatic fever has led some clinicians, in Germany notably Graff and Aschoff, to suppose that it is an infectious condition due to some specific, as yet unidentified, organism. In Britain and the U.S.A., where the disease is much commoner, epidemiological, bacteriological, and serological studies have led to a different view and one which in German literature is propounded by Klinge and Rössle. These observers hold that acute rheumatic fever is a response, probably allergic, to a non-specific acute streptococcal infection. The following findings of the author support this view: the incidence of rheumatic fever ran closely parallel with that of scarlet fever. Each "epidemic" of rheumatic fever (in institutions) was preceded by an epidemic of sore throats. Serological examination with various antistreptococcal antigens showed that the antibody titre rose even higher in patients with rheumatic fever than in patients with streptococcal infections not followed by rheumatic fever. It was proved that the prophylactic use of penicillin and sulphonamides for long periods in people prone to rheumatic fever reduced considerably the incidence of relapses.

It is not known why some people develop acute rheumatism, scarlet fever, erysipelas, or nephritis in response to a streptococcal infection; presumably the difference lies in the constitution of the individual, and this may account for the observation that scarlet fever generally attacks large, healthy, robust children, whereas those with rheumatic fever tend to be below average size and of poor physique.

Marianna Clark

2639. **Cortisone in Sydenham's Chorea. Report of Two Cases**

N. ARONSON, H. S. DOUGLAS, and J. M. LEWIS. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 30–33, Jan. 6, 1951. 2 figs., 10 refs.

In view of the traditional belief that chorea is a manifestation of rheumatic fever, cortisone was administered by these observers to 2 children suffering from

acute chorea. In neither case was there any favourable response. The total amount of cortisone administered was 0·975 g. over a 14-day period in one case, and 2·175 g. over a 20-day period in the other. In one of these cases nearly 1 g. of adrenocorticotrophin was given later over a period of 9 days, and this also was without significant effect upon the course of the disease.

W. S. C. Copeman

2640. **Early Experience in the Treatment of Progressive Rheumatic Carditis with Adrenocorticotrophin and Cortisone.** (Première expérience de traitement des cardites rhumatismales évolutives par l'ACTH et la cortisone)

F. Coste, R. Turpin, F. Delbarre, R. Tourneur, and M. Oury. *Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris* [*Bull. Soc. méd. Hôp. Paris*] **66**, 1577–1608, 1950. 12 figs., 9 refs.

Details are given of the treatment with adrenocorticotrophin (ACTH) and cortisone of 15 children with acute rheumatic fever. In most cases ACTH was used initially, since it was considered to act more rapidly than cortisone. Administration of the hormone was continued for 3 to 6 weeks in dosage varying with the potency of the preparation. One patient died and the first 5 had such small doses that the effects of treatment could not be assessed accurately. In the other cases there was a rapid regression of general signs and symptoms. Pericarditis subsided rapidly and there appeared to be definite though slower improvement in cases of myocardial or endocardial involvement. Established valvular lesions were unaffected. Some complications occurred, of which oedema and oliguria were the most serious. Relapses occurred when treatment was stopped suddenly or too early.

From a careful study of these cases the authors conclude that ACTH and cortisone have beneficial effects on the cardiac lesions in the acute stage of rheumatic fever, but recommend further prolonged and statistical investigations to determine whether permanent cardiac damage is preventable by early hormone therapy.

Kathleen M. Lawther

2641. **Effects of Pituitary Adrenocorticotropic Hormone (ACTH) on Rheumatic Fever and Rheumatic Carditis**

B. F. Massell and J. E. Warren. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **144**, 1335–1341, Dec. 16, 1950. 2 figs., 14 refs.

The clinical effect of pituitary adrenocorticotropic hormone (ACTH) has been observed in 20 patients with active rheumatic fever. In many patients the rheumatic process was severe, and most of them had active carditis. The initial response of fever and joint involvement was especially impressive, but pericarditis, subcutaneous nodules and other rheumatic manifestations also frequently disappeared during hormone therapy. Withdrawal reactions with clinical manifestations of rheumatic fever or with only elevation of the sedimentation rate were sometimes observed when hormone therapy was completed. In most but not all such instances these signs of rheumatic activity again subsided spontaneously over varying periods of time without any further treatment.

Of 2 patients with chorea, one showed striking improvement in association with pituitary adrenocorticotropic hormone therapy; the other failed to respond to a 10-day period of treatment with the hormone in large doses. Treatment has been completed in 17 of the 18 patients with rheumatic manifestations other than chorea. Three of these cases must be considered therapeutic failures. Although the total duration of active rheumatic fever varied greatly in the remaining 14 patients, it was our impression that, on the whole, recovery took place sooner than it would have without treatment.

The apparent response of pericarditis, congestive failure and subcutaneous nodules to pituitary adrenocorticotropic hormone in a number of patients and the complete disappearance in 2 patients of all significant murmurs strongly suggest that in some instances active carditis may be favourably influenced by hormone treatment. Also, there are hopeful indications that if therapy is begun early in an attack of rheumatic fever cardiac damage may be lessened or prevented.

The only harmful reactions definitely attributable to pituitary adrenocorticotropic hormone in this series were retention of fluids with aggravation of congestive heart failure and, in one instance, serious mental depression. It is possible that in one patient with long-standing, low-grade rheumatic fever the degree of rheumatic activity was greater after discontinuation than before the administration of the hormone. One instance of fatal jugular thrombophlebitis was encountered, but as yet there is no definite reason to attribute this complication to pituitary adrenocorticotropic hormone therapy.

The mechanism of hormonal influences in rheumatic fever is not yet understood.—[Authors' summary.]

2642. **Effect of Pituitary Adrenocorticotropic Hormone (ACTH) in Acute Rheumatic Carditis**

M. G. Wilson and H. N. Helper. *Journal of the American Medical Association* [*J. Amer. med. Ass.*] **145**, 133–138, Jan. 20, 1951. 4 figs., 7 refs.

This is a report of the trial of adrenocorticotropic hormone (ACTH) in 11 consecutive cases of acute rheumatic carditis, in patients aged 6 to 18 years. Compared with previous experience ACTH had a notable effect on the course, duration, and resultant state. From their experience the authors suggest that the rheumatic process is reversible. Dosage used was 80 to 100 mg. every 6 hours for 3 days, and then 40 to 60 mg. daily for 4 days. Insufficient dosage may result in a relapse after cessation of treatment. Signs and symptoms of carditis subsided in 3 to 7 days, and patients were ambulant in 2 to 4 weeks.

David Nicholson

2643. **Acute Infectious Lymphocytosis in an Adult**

B. Malamos and A. Stamatelakis. *Lancet* [*Lancet*] **1**, 148–150, Jan. 20, 1951. 1 fig., 11 refs.

History of Medicine

2644. **The Consulting Room through the Ages.** (Le cabinet de consultations à travers les ages)
R. VAULTIER. *Presse Médicale* [*Pr. méd.*] **82**, 1489–1492, Dec. 25, 1950. 8 figs.

The author comments on the paucity of information about the consulting-room through the ages, and attempts [successfully] to remedy this defect so far as France is concerned. The appearance of the barber-surgeon's room of the fifteenth to eighteenth century is described. Simplicity was the keynote, only the implements of the owner's trade being in evidence, apart from the chairs of the consultant and his patient. Books were conspicuous by their absence; the barber-surgeon had neither the time nor the inclination to improve himself by reading. With the physician, matters were different. He was well educated and his consulting-room was lavishly furnished. Books in plenty, various vessels filled with coloured liquids, engravings, and other eye-catching objects surrounded the doctor and his patient as they sat on handsome chairs. In the golden age of France during the reigns of Louis XIV and Louis XV the physician's consulting-room was even more sumptuously furnished, with the emphasis on fine chairs, tables, cabinets, framed diplomas, portraits, and of course, books in profusion. The essential thing was to make a show, to dazzle the patient. In the nineteenth century the city physician was still inclined to make a display, but his more humble rural brother was modest in his apartment.

[The original article is rich in detail and needs to be read in its entirety and a study made of the excellently reproduced illustrations accompanying it in order to obtain a true picture of the French consulting-room through the centuries.] *H. P. Tait*

2645. **Medicine in the Tenth Century. Facts from Welsh Medieval Law**
J. G. PENRHYN JONES. *Medicine Illustrated* [*Med. ill.*] **5**, 84–86, Feb., 1951. 11 refs.

The early Welsh tribal system was unique in Western Europe, and in the legal codes drawn up by Hywel Dda, the first king of Wales, there are certain clauses relating to the practice of medicine.

The doctor was one of the officers of the royal and princely courts and was ranked last but one in order of precedence, below the ostler, the brewer, and the bard. A permanent member of the king's retinue, whether in the palace or on warring expeditions, he was paid a fixed salary and treated all members of the court gratuitously, receiving from the patients only their bloodstained clothing. Exceptions to this rule were the special fees paid by a patient with any of the " three dangerous wounds ", that is, penetrating wounds of the head or abdomen or fracture of a limb.

The Welsh laws placed a fixed monetary value upon honour, the limbs of men and women, and upon their cattle and other belongings. In this scheme the physician's " sarhad " (the fine payable for insult) was six head of cattle and six score of silver; his " galanas " (worth according to rank) was one hundred and twenty-six head of cattle.

Injuries to the body received compensation on a single scale without regard to rank and for this purpose the body was divided into fourteen parts of which the tongue was the principal member because it " defended the rest ". Each finger and toe was valued at " one cow and twenty pence ", the thumb and the big toe being worth double. Front teeth were two shillings each, blood was two shillings, and every bone of any size was worth twenty pence.

Apart from the account of the physician's functions and status, these laws give much information of a more general nature which is invaluable to the historian of medicine. *F. N. L. Poynter*

2646. **The Moon, Werewolves, and Medicine**
W. B. MCDANIEL. *Transactions and Studies of the College of Physicians of Philadelphia* [*Trans. Stud. Coll. Phys. Phila.*] **18**, 113–122, Dec., 1950. Bibliography.

The moon was worshipped as a goddess by the Greeks and Romans and was thought to have a considerable influence on human affairs. In her position in the sky she was called by the Greeks Selene and by the Romans Luna, while in her human shape she was named Artemis and Diana. Yet another of her forms was that of Hecate, the mistress of Hell and patroness of sorcery and the black arts.

The Romans believed that she had an active influence on health and on the raising of animals and crops. A newborn child was thought to be in greatest danger at the time of the full moon; exposure to the moon caused headaches, falling hair, and weakening of the brain, while the course of many other diseases was supposed to be affected by the changes of the moon. In order to counteract this influence the moon was invoked in the form of Diana.

Many of the old Roman beliefs have survived in Italian folklore. Girls in Naples still pray to the moon to increase the size of their breasts, and headaches, neuralgia, and skin diseases are still popularly supposed to be caused by the moon, as well as a temporary blindness (" moonblink ") brought on by sleeping in moonlight. The effect on the brain has been preserved in the term " lunatic ", a term which was sometimes applied to epileptics. There was also a special kind of madness attributed to the effect of the moon wherein the sufferer thought himself changed into an animal, and particularly into a wolf, and this so-called " lycanthropy " is the origin of the many folk-tales of werewolves and vampires.

The wolf was highly regarded in the magic arts (*vide* Ovid, Lucan, Pliny, Shakespeare); he was possessed of

the evil eye and all parts of his body were used in " magic recipes ". There are tales of werewolves in Pliny and Tibullus, but the best description is to be found in the *Satyricon* of Petronius.

If we are to believe contemporary writers, lycanthropy was fairly common in the Middle Ages; as well as being an affliction caused by the moon it could also be inborn, and all children born on Christmas night were thought to be particularly prone to it. The cure was simple, for it consisted merely in giving the sufferer some slight injury sufficient to draw blood; the " wolfishness " would escape with the flow of blood.

F. N. L. Poynter

2647. **Early Municipal and State Boards of Health**
H. D. KRAMER. *Bulletin of the History of Medicine* [*Bull. Hist. Med.*] **24**, 503–529, Nov.–Dec., 1950. Bibliography.

The middle of the nineteenth century saw the beginning of organized efforts at public health reform in the United States. In 1866 the first major victory was won in the passing of a comprehensive health law for New York City. The early local boards of health, consisting of politicians, neglected public health problems. Epidemics forced them into speedy, if crude, activity in every direction, but normally only drainage, water supply, refuse disposal, and interment engaged their attention. Voluntary groups occasionally pointed out growing social abuses, and private organizations showed greater interest in health problems than the authorities. The phenomenal growth of U.S. cities in the middle decades handicapped [yet made imperative] sanitary reform. Extensive immigration brought in its train poverty, disease, and high mortality rates. Citizens became interested and public officers were reprimanded for persistently ignoring reform recommendations. In 1857 the New York Academy of Medicine petitioned the State legislature for remedial measures, but 3 health bills were defeated. The Civil War postponed the conflict between the corrupt and inefficient city inspector and the aroused citizens, but sanitary conditions grew more unendurable. A New York Citizens' Association, formed to wrest municipal government from the political machine, gave financial and moral support to the public health movement. In 1856 it produced a drastic Bill, and public resolution and the fear of approaching cholera ensured the passing of the measure.

The Metropolitan Health Act of 1866 abolished the existing health department of the city and authorized a new sanitary district. A board of health of nine was set up. Weekly and annual reports were to be submitted and certain useful information collected. The board had authority to demand periodic reports from all public hospitals, schools, dispensaries, and prisons, to provide facilities for gratuitous vaccination and disinfection, to give medical relief to the poor, to remove and isolate cases of contagious diseases, and to supervise theatres and places of amusement. Citizens could report health nuisances in complaint books. The board could exercise wide quasi-judicial and summary powers. During epidemics extraordinary authority was given to it. In the next years streets were cleansed, tenements disinfected, and slaughter-houses moved. Over half the cellar lodging-houses were closed and the mortality rate fell. The responsibility for the failures of the board rested with the corrupt city government, but municipal reorganization in 1870 led to greater efficiency in the succeeding years. After the New York Act of 1866 other areas quickly followed suit, so that by the end of the '70s practically every large city had established local control over health matters.

After achieving the necessary local control, American sanitarians turned their attention to State governments. Massachusetts, foremost in its promotion of sanitary reform, was in 1869 the first State to establish a board of health. To forestall strong local and private opposition, the pioneers, in their first communication to the health boards of towns and villages, enumerated a long list of the nuisances they would attack and the measures they would enforce. A Code of Sanitary Regulations was published in 1873. Although unremunerated, members of the board worked hard, visiting sites of nuisances complained of personally. The incidence of particular diseases was studied and papers were published throughout the '70s. The board's annual reports dealt with ventilation, water supply, food poisoning, adulteration, vital statistics, and infant mortality. Circulars were issued for the benefit of local health officers, and weekly and monthly summaries of vital statistics were published. Because diffusion of a knowledge of hygiene was regarded as a primary duty of the new board, it was suggested that meetings should be held throughout the State to discuss sanitary precautions and that doctors should give lectures. Other States followed this example, many modelling their sanitary laws on those of Massachusetts. In 1872 the American Public Health Association was founded. The rapid growth of local health authorities made possible and easier the advent of State boards, and in their turn the development of the latter heralded the establishment of the National Board of Health in 1879.

[Although the American public health movement was launched later than in Great Britain, when it did come, legislation and activity were more comprehensive and went deeper. The average citizen was keenly interested, and it is important to note that business men were convinced earlier of the economic and social costs of public ill-health. Britain superimposed her public health activity on a chaotic and complex system of local government, whereas the U.S.A. reorganized her districts and authorities, and greater efficiency was possible. Here, generally a dozen bodies attended to their separate functions; there, the inevitably interrelated problems and their solution were integrated under one board. Significant too was the fact that public education in hygiene was pursued, and the medical expert used, on a larger scale and earlier in the U.S. Lastly, the American system started with the local unit and worked up to a National Board after 13 years. In Britain the State Board came first, to enforce the creation of local health authorities on the unsympathetic cities.]

Ruth Hodgkinson

2648. **The History of Medical Education. Parts I and II**
W. B. KNAPMAN. *Medicine Illustrated* [*Med. ill.*] **4**, 613–616, Dec., 1950. 2 figs.; **5**, 35–40, Jan., 1951. 3 figs.

2649. **The History of the London Hospital Medical College**
D. M. DAVIES. *Medicine Illustrated* [*Med. ill.*] **5**, 28–34, Jan., 1951. 5 figs., 3 refs.

2650. **History of the Bristol Medical School**
J. A. NIXON. *Medicine Illustrated* [*Med. ill.*] **5**, 81–83, Feb., 1951. 3 figs.

2651. **Medical Books of the Seventeenth Century in the Library of the Paris Faculty of Medicine.** (Les livres médicaux du XVII^{e} siècle à la bibliothèque de la faculté de médecine de Paris)
A. HAHN and P. DUMAIRE. *Semaine des Hôpitaux de Paris* [*Sem. Hôp. Paris*] **26**, 4918–4940, Dec. 25, 1950. 9 figs.

2652. **English Domestic Medicine in the Eighteenth Century. III. From the Letters of Josiah Wedgwood**
A. MEIKLEJOHN. *Postgraduate Medical Journal* [*Postgrad. med. J.*] **26**, 663–664, Dec., 1950.

2653. **Typhoid Fever in Ireland. A Reminiscent Survey of its Control**
J. D. MACCORMACK. *Irish Journal of Medical Science* [*Irish J. med. Sci.*] **6**, 49–64, Feb., 1951. 1 fig.

2654. **Internal Medicine: its Development and Practice in Australia during Fifty Years**
C. G. MCDONALD. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 1–5, Jan. 6, 1951. 1 fig.

2655. **The Development and Practice of Surgery in Australia during Fifty Years**
V. HURLEY. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 5–10, Jan. 6, 1951. 4 figs.

2656. **General Practice in Australia at the Dawn of the Century**
R. S. SKIRVING. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 10–12, Jan. 6, 1951. 1 fig.

2657. **The Growth of Specialism in Australia during Fifty Years and its Significance for the Future**
C. B. BLACKBURN. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 20–24, Jan. 6, 1951. 2 figs.

2658. **The Development of Australian Hospitals in the Last Fifty Years**
A. E. BROWN. *Medical Journal of Australia* [*Med. J. Aust.*] **1**. 40–45, Jan. 6, 1951. 4 figs.

2659. **The Growth and Development of Public Health Services in Australia during Fifty Years**
A. J. METCALFE. *Medical Journal of Australia* [*Med. J. Aust.*] **1**, 45–51, Jan. 6, 1950. 4 figs.

2660. **The Contribution of Charles Turner Thackrah: English Pioneer in the Field of Industrial Health**
J. W. BROWN. *Archives of Industrial Hygiene and Occupational Medicine* [*Arch. industr. Hyg. occup. Med.*] **2**, 517–528, Nov., 1950. 9 refs.

This article is an American appreciation of the work of Charles Turner Thackrah, an English pioneer in the field of industrial medicine. A brief review is given of the clinical observations of early writers from the time of Hippocrates to the end of the seventeenth century. Up to this period, however, no comprehensive approach to the subject of occupational health was forthcoming and only in 1700 did Bernardino Ramazzini publish his remarkable work dealing with the occupational diseases of nearly every trade. It was not until many years later that the full significance of Ramazzini's writings was appreciated and it was left to later authors, particularly Thackrah, to bring home to the public the misery and disease which existed amongst workmen as a direct result of their occupation, and to point out that much could be done in the prevention of these conditions by making use of the knowledge then available. Thackrah was born in 1795 and an interesting description is given of his subsequent career. It was in 1824, when he was in practice in Leeds, that Thackrah began to study the effects of occupation on the health of the worker, and in 1831 he published a book which was the first comprehensive work of its kind on the subject of occupational health to be written in English. His keen clinical observations, shrewd conclusions, and original but practical observations for preventive measures are embodied in this book. The remainder of the article is given over to a brief review of Thackrah's book, and many extracts from his writings are included. Although Thackrah died at the age of 37 years, the author emphasizes the great importance of his work in the moulding of a programme of industrial health not only in England but also in America.

A, Thelwall Jones

2661. **Robert Boyle and the Human Blood**
E. HACKETT. *Irish Journal of Medical Science* [*Irish J. med. Sci.*] **6**, 528–533, Nov., 1950. 13 refs.

2662. **Sir Dominic Corrigan and the Deformed Heart Valves**
E. PODOLSKY. *Medical Annals of the District of Columbia* [*Med. Ann. Distr. Columbia*] **19**, 621–623 and 659, Nov., 1950.

2663. **The Life of James Marion Sims**
J. L. BAER. *American Journal of Obstetrics and Gynecology* [*Amer. J. Obstet. Gynec.*] **60**, 949–966, Nov., 1950. 21 refs.

2664. **Sir John Floyer (1649–1734)**
L. LINDSAY. *Proceedings of the Royal Society of Medicine* [*Proc. roy. Soc. Med.*] **44**, 43–48, Jan., 1951.

2665. **Charles Bouchard (1837–1915)**
A. BAUDOUIN. *Bulletin de l'Académie Nationale de Médecine* [*Bull. Acad. nat. Méd., Paris*] **114**, 732–739, Dec. 12, 1950.

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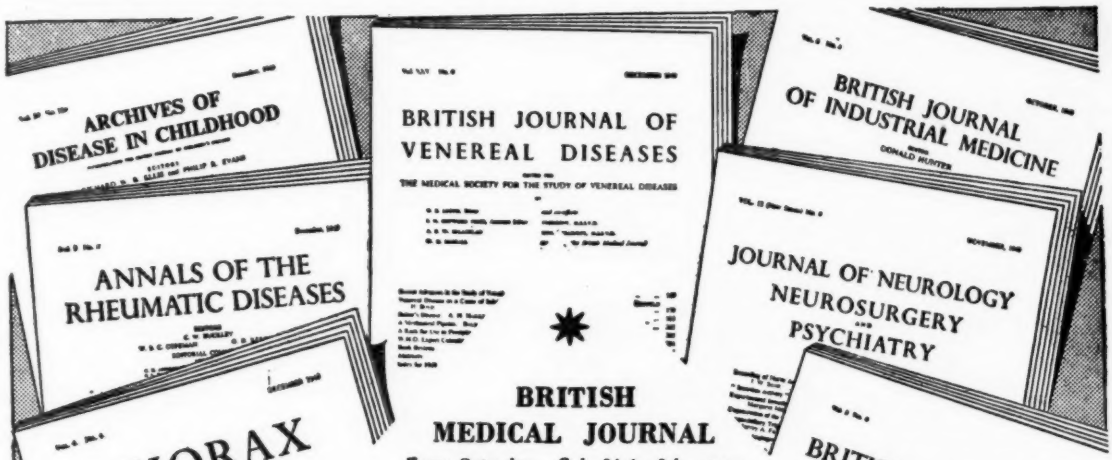
This journal is planned to provide the reader with a selection of abstracts of the more important articles appearing in medical periodicals published in different parts of the world. Comment by the abstracter, when thought necessary, is inserted between square brackets, usually at the end of an abstract. In some instances only the titles of articles are provided.

After the title of each journal from which an abstract is taken we print the abbreviation given in the *World List of Scientific Periodicals*. The titles of articles from foreign journals are translated into English.

This journal is essentially a guide to work in progress in the world's medical centres. No abstract can be regarded as a substitute for the article abstracted. For complete information the original article must be consulted. Our aim is to give the reader sufficient details in an abstract to enable him to judge whether the original is, for him, worth reading in full.

The abstracts are grouped in broad classifications which represent the special fields of study into which Medicine is divided. The specialist will, it is hoped, learn from this journal of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. The representation in one journal of the several aspects of Medicine will, it is believed, give an integrated picture of the whole, necessary in this age of specialization.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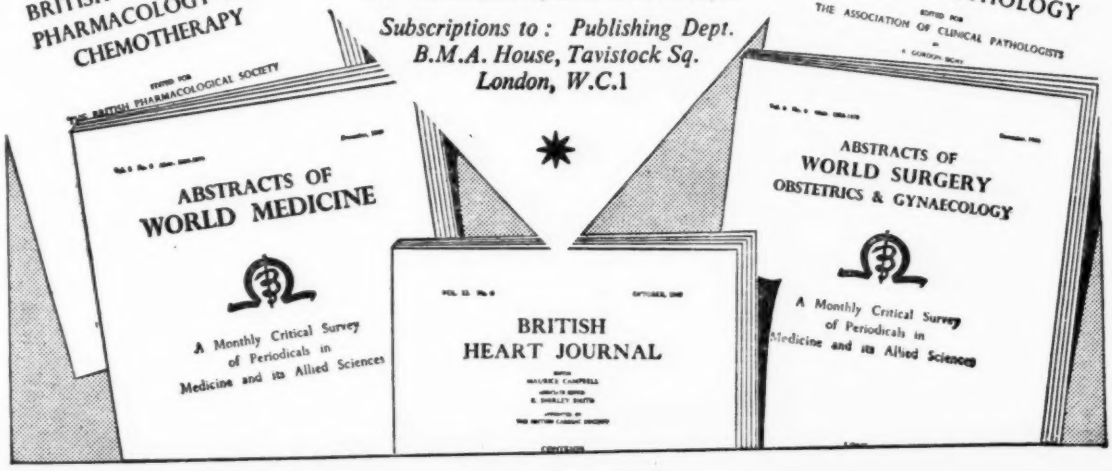
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